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AS-NZS 1754 (2010) (English): Child restraint systems for use in motor vehicles [By Authority of Australian Consumer Protection Notice No. 21 of 2011]

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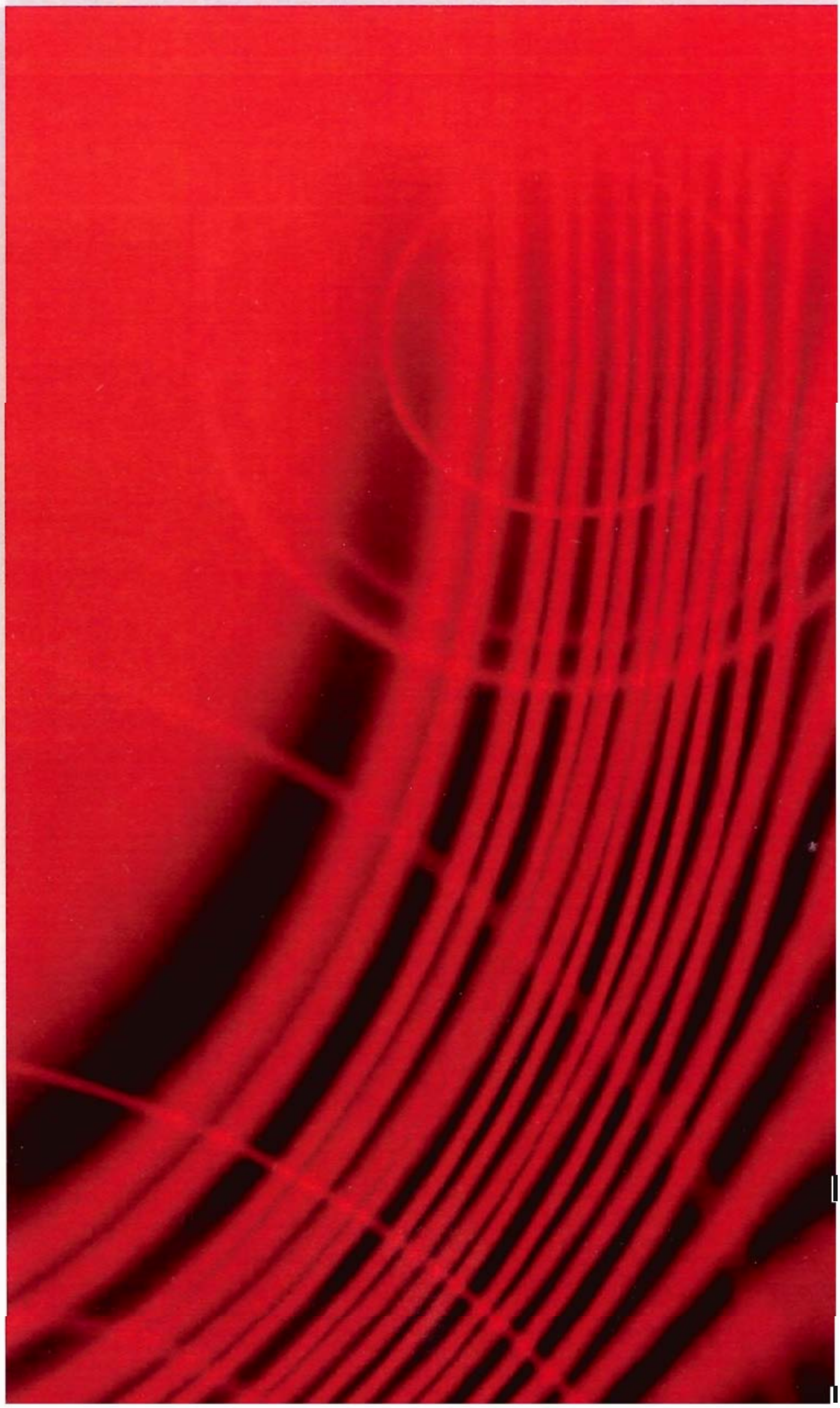
STANDARDS
NEW ZEALAND
PAEREWA AOTEAROA

AS/NZS 1754:2010

Australian/New Zealand Standard™

Child restraint systems for use in motor vehicles



STANDARDS
Australia

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee CS-085, Child Restraints for Use in Motor Vehicles. It was approved on behalf of the Council of Standards Australia on 7 January 2010 and on behalf of the Council of Standards New Zealand on 27 January 2010.
This Standard was published on 24 February 2010.

The following are represented on Committee CS-085:

Australian Automobile Association
Australian Automotive Aftermarket Association
Australian Chamber of Commerce and Industry
Australian Competition and Consumer Commission
Australian Industry Group
Centre for Automotive Safety Research
Certification Interests (Australia)
Consumers Federation of Australia
Department of Infrastructure, Transport, Regional Development and Local Government (Australia)
Engineers Australia
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This Standard was issued in draft form for comment as DR AS/NZS 1754.

AS/NZS 1754:2010

Australian/New Zealand Standard™

Child restraint systems for use in motor vehicles

Originated as AS E46—1970.
Previous edition AS/NZS 1754:2004.
Seventh edition 2010.

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Jointly published by Standards Australia, GPO Box 476, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6140

ISBN 978 0 7337 9362 2

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CS-085, Child Restraints for Use in Motor Vehicles, to supersede AS/NZS 1754:2004.

The Standard specifies a range of design and performance requirements for devices to restrain children in motor vehicles to provide protection to the child in the event of a crash. This Standard requires tests to be conducted according to methods contained in the AS/NZS 3629, *Methods of testing child restraints* series.

Major revisions in this edition of AS/NZS 1754 include:

(a) Introduction of requirements for a new type of booster seat ('Type F'), intended to accommodate children up to 138 cm in height. These restraints are subject to additional requirements for side support to control posture and position.

(b) Removal of booster cushions from the Standard as they are unable to offer side impact protection.

(c) Introduction of new requirements, applicable to all booster seats, intended to reduce the likelihood of abdominal injury to children using booster seats.

(d) Changes to the way in which child restraints are categorized. Child restraints have previously been categorized in terms of the mass of the child intended to use the restraint. Mass-based categories are no longer used in this Standard and have been replaced by approximate age ranges, and restraints now require marking to show the height of the shoulders of a child that fits the restraint.

(e) Introduction of new requirements for colour-coded marking of the seatbelt path on the child restraint.

For the next revision of this Standard the Committee intends to specify a test method and assessment criteria for the energy attenuating properties required by Clause 3.2.1.

Statements expressed in mandatory terms in notes and footnotes to tables and figures are deemed to be requirements of this Standard.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

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Australian/New Zealand Standard

Child restraint systems for use in motor vehicles

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for restraining devices for child occupants of passenger cars and their derivatives, such devices being intended, when properly selected, correctly installed and correctly adjusted, to reduce the risk of bodily injury in a vehicle impact. The devices may also have application to other types of vehicles.

NOTE: This Standard does not cover child restraints that are an integrated feature of a motor vehicle.

1.2 OBJECTIVE

The objective of the Standard is to provide minimum design, construction and performance requirements for child restraint systems in order to promote the provision of a high level of protection for children travelling in motor vehicles.

1.3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS		
1753	Webbing for restraining devices for occupants of motor vehicles	
2001	Methods of test for textiles	
2001.5.4	Method 5.4:	Dimensional change—Domestic washing and drying procedures for textile testing (ISO 6330:2000, MOD)
2282	Methods for testing flexible cellular polyurethane	
2282.8	Method 8:	Determination of force deflection
2331	Methods of test for metallic and related coatings	
2331.3.1	Method 3.1:	Corrosion and related property tests—Neutral salt spray (NSS) test
2700	Colour Standards for general purposes	
2755	Textile fabrics—Burning behaviour	
2755.2	Method 2:	Measurement of flame spread properties of vertically oriented specimens
2755.3	Method 3:	Determination of surface burning time
AS/NZS		
2465	Unified hexagon bolts, screws and nuts (UNC and UNF threads)	
3629	Methods of testing child restraints	
3629.1	Method 1:	Dynamic testing
3629.2	Method 2:	Determination of hazardous throat contact in abnormal situations
3629.3	Method 3:	Dynamic testing of upper anchorage components
3629.4	Method 4:	Determination of the force required to adjust a harness

AS/NZS	
3629.5	Method 5: Determination of quick-release device actuation force
3629.6	Method 6: Determination of recline angle
3629.7	Method 7: Test for suitability of seatbelt length
3629.8	Method 8: Test for suitability of booster seat profile
3629.9	Method 9: Test for length of seating surface on a booster seat
4475	Restraint systems for motor vehicles—Performance tests
4475.5	Method 5: Determination of locking angle of a tilt-lock adjustment device
AS/NZS ISO	
8124	Safety of toys
8124.1	Part 1: Safety aspects related to mechanical and physical properties (ISO 8124-1:2000, MOD)
8124.3	Part 3: Migration of certain elements
ISO	
3795	Road vehicles, and tractors and machinery for agriculture and forestry—Determination of burning behaviour of interior materials
ASME	
B18.21.1	Lock washers (Inch series)
FMVSS	
302	Flammability of interior materials—Passenger cars, multi-purpose passenger vehicles, trucks and buses
NZS	
5432	Webbing for restraining devices for occupants of motor vehicles
SAE	
J369	Flammability of polymeric interior materials—Horizontal test method
J211	Instrumentation for impact tests

1.4 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

1.4.1 Accessories

Parts that may be added to, or removed from, a child restraint in normal use.

1.4.2 Actuation surface

The surface area of a quick-release device that is pressed to activate the device.

1.4.3 Adjuster

A device designed to provide the means of adjustment.

1.4.4 Airway region

The surface area of the dummy neck elements containing the central 50 percent of each element width, when viewed from in front of the dummy.

1.4.5 Anchorage components

The terminal parts of a child restraint design for attachment to a vehicle or seat.

1.4.6 Anchorage point

That part of a vehicle at which the restraining forces from the anchorage component is transferred to the vehicle.

1.4.7 Attachment bolt

Set screw, see Clause 1.4.33.

1.4.8 Attachment clip

A device that allows the child restraint to be quickly and conveniently attached to, and removed from, the vehicle.

1.4.9 Authority

A body that has legal powers and rights.

1.4.10 Booster seat

A device used for raising the child's position in the motor vehicle and adapting an adult seatbelt to make it suitable for a child, and having a back above the seating plane.

1.4.11 Chair

The part of a child restraint that seats the child.

1.4.12 Child restraint

A device used in conjunction with an adult seatbelt to restrain a child passenger of a motor vehicle in the event of a vehicle impact and thus minimize the risk of bodily injury.

1.4.13 Converter

A device, other than a booster seat, for converting an adult lap-sash seatbelt to the equivalent of a lap belt for use with a child restraint, or for varying the geometry of an adult lap-sash belt to make it suitable for use as a child restraint.

1.4.14 Crotch strap

A centrally located webbing strap that is designed to attach the quick-release device to the child restraint and transmit the occupant-restraining forces acting on the quick-release device to the child restraint.

1.4.15 Downward

Towards the floor of the vehicle.

1.4.16 Enclosing restraint

A child restraint consisting mainly of an enclosure.

1.4.17 Extension strap

A strap, with an anchor fitting and an attachment clip that is used for the installation of child restraints in vehicles where the child restraint anchorage is located at an extended distance from the vehicle seat.

1.4.18 Fabric

A woven, knitted or non-woven textile material in the form of a single material or multi-component (coated, quilted and multi-layered sandwich construction, and similar combinations) materials.

1.4.19 Flame spread time

The time taken by a flame on a burning material to travel from the first to the third marker threads when tested in accordance with AS 2755.2, using a 5 s surface ignition time.

1.4.20 Forward

Towards the front of the vehicle.

1.4.21 Harness

Webbing straps used for restraining the occupant either partly or wholly.

1.4.22 Leg straps

Two or more flexible components that are designed to attach the quick-release device to the restraint and transmit the occupant-restraining forces acting on the quick-release device to the restraint.

1.4.23 Means of adjustment

Those parts of a child restraint by which the restraint is adjusted to suit the wearer or the vehicle or both.

1.4.24 Pelvic area

The area bounded by the sides of the occupant's torso, the seating surface and a plane 200 mm above and parallel to the seating surface. The 200 mm distance is measured with test mass in Figure 3.4 positioned on the seating surface as required by Clause 3.2.5(k)(ii).

1.4.25 Permanently attached

Where a component is attached to the child restraint or another component in such a way that it cannot be removed casually or inadvertently, but need not be so securely attached as to require the use of a tool to remove it.

1.4.26 Permanently fixed

Where a component is attached to the child restraint or another component in such a way that it cannot be completely detached without the use of tools.

1.4.27 Permanently fixed in position

Where a component is attached to the child restraint or another component in such a way that it cannot be completely detached without the use of tools, but whose position cannot be adjusted or altered.

1.4.28 Quick-release device

A securing device with provision for quickly releasing the child from the child restraint, and nominated by the manufacturer of the child restraint as being provided for that purpose.

1.4.29 Rearward

Towards the rear of the vehicle.

1.4.30 Rigid component and material

Any component or material that is stiffer than webbing, fabric, padding, comfort foam, and structures that significantly flex or hinge when a force of 50 N is applied.

1.4.31 Roping

Any twisting, crushing or curling of the webbing that appreciably reduces the area of the webbing in contact with the wearer.

1.4.32 Securing device

A device for securing the child in the child restraint, or for securing the child restraint to the vehicle. A securing device may or may not have provision for quick release.

1.4.33 Set screw

Used to fix the upper anchor fitting to the vehicle, and referred to in consumer literature as an 'attachment bolt'.

1.4.34 Shall

Indicates that a statement is mandatory.

1.4.35 Should

Indicates a recommendation.

1.4.36 Splitter plate

A plate or bracket connecting the harness adjuster strap to the shoulder straps and allowing the disconnection of the shoulder straps.

1.4.37 Strap

A flexible component designed to restrain the occupant of a child restraint, or the child restraint, or a combination of these, and transmit the restraining forces to the vehicle.

1.4.38 Submarining

An occurrence where the lap belt rides up over the iliac crest and into the soft tissue area of the abdomen.

1.4.39 Surface burning time

The time required for the pile or nap of a fabric to burn to the reference mark, when tested in accordance with AS 2755.3. It is expressed as the minimum value of a number of determinations made during testing of the fabric.

1.4.40 Swing ticket

A label temporarily attached to a child restraint by any means that will allow its removal.

1.4.41 Tilt-lock adjustment device

A device for adjusting the effective length of a strap so that when a load is applied along the length of the strap, locking occurs, and when the device is tilted away from the line of applied load, length adjustment is provided.

NOTE: Tilt-lock adjustment may be provided as an attaching clip, a security device, a quick-release device, or a strap.

1.4.42 Transversely installed

A restraint where the child lies approximately at right angles to the forward direction of travel of the vehicle.

1.4.43 Trims

Trimmings such as piping, appliqués, ribbon, overlays, motifs, embroidery, edge trim and similar ornaments.

1.4.44 Upper anchorage strap

The flexible component designed to restrain the top portion of the child restraint, referred to in consumer literature as the ‘anchorage strap’.

1.4.45 Upper anchor fitting

A device that attaches to the anchorage point in a vehicle for the purpose of engaging the upper anchorage strap attachment clip, referred to in consumer literature as the ‘anchor fitting’.

1.4.46 Upward

Towards the roof of the vehicle.

1.5 TYPE DESIGNATION

Child restraints shall be designated in accordance with the following:

(a) *Type A1*

Rearward-facing restraint with a harness or other means of retaining the occupant of supine length up to 70 cm, and approximately 6 months of age.

(b) *Type A2*

Rearward-facing restraint with a harness or other means of retaining the occupant of supine length up to 80 cm, and approximately 12 months of age.

(c) *Type A3*

Transversely installed restraint with a harness or other means of retaining the occupant of supine length of up to 70 cm and approximately 6 months of age.

(d) *Type B*

Forward-facing chair with harness, suitable for children approximately 6 months to 4 years of age.

(e) *Type C*

Forward-facing harness without chair, to be used in conjunction with a booster seat suitable for children approximately 4 to 7 years of age and without a booster seat approximately from 8 to 10 years of age.

(f) *Type D*

Rearward-facing chair with harness, suitable for children approximately 6 months to 4 years of age.

(g) *Type E*

A booster seat used in conjunction with a Type C child restraint and a seatbelt, or with a lap-sash seatbelt, suitable for children approximately 4 to 8 years of age whose height is less than 128 cm.

(h) *Type F*

A restraint consisting of either—

(i) a booster seat used in conjunction with a Type C child restraint and a seatbelt, or with a lap-sash seatbelt suitable for children approximately 4 to 10 years of age whose height is less than 138 cm; or

(ii) a converter used in conjunction with a seatbelt, suitable for children approximately 8 to 10 years of age.

SECTION 2 MATERIALS

2.1 WEBBING

The following shall apply:

(a) For Type C child restraints, load-carrying webbing shall be Class C or Class D, in accordance with AS 1753/NZS 5432.

(b) Load-carrying webbing for other child restraint types shall comply with the requirements for Class B, Class C, or Class D in accordance with AS 1753/NZS 5432.

(c) The end of any webbing shall be treated to prevent unravelling.

NOTE: For Items (a) and (b), AS 1753 applies in Australia and NZS 5432 applies in New Zealand.

2.2 METAL PARTS OR COATED METAL PARTS

Metal parts or coated metal parts, when exposed for not less than 50 h to salt spray in accordance with AS 2331.3.1, shall show no significant evidence of base metal corrosion, or of blistering of the coating, and shall be operational.

NOTES:

1 Significant evidence means base metal corrosion extending more than 3 mm from an edge or from a line scribed through the coating.

2 Testing may be performed on individual components or on assemblies.

2.3 FLAMMABILITY

2.3.1 Fabrics and padding materials

When tested in accordance with AS 2755.2, all fabrics, including coated fabrics, padding materials, trimmings and attachments, but excluding webbing, shall comply with the following requirements:

(a) The flame spread time (see Clause 1.4.19) shall be 12 s or greater in the lengthwise direction and the widthwise direction, and no one determination of the time to burn a test specimen shall be less than 10 s in either the lengthwise direction or the widthwise direction. These requirements shall be met before and after washing in accordance with the wash procedure below.

Test specimens shall be washed twice in accordance with Procedure 7B in AS 2001.5.4. After the second wash, test specimens shall be tumble-dried at a temperature that will not damage the fibre.

If, after a repeat test, as required by the relevant clause of AS 2755.2, four or more of six specimens fail to burn to the third marker thread in the lengthwise direction, and four or more of six specimens fail to burn to the third marker thread in the widthwise direction, the material shall be deemed to have passed the flame spread time test.

NOTE: AS 2755.2 states that if, in any one set of three specimens, one result exceeds the lowest result by 50 percent for no apparent reason, or if one or two specimens fail to reach one of the marker threads, another set of three specimens is required to be tested for that direction or face.

(b) After washing, fabrics with a pile or nap shall be tested in accordance with AS 2755.3, and shall have a surface burning time of 10 s or greater.

(c) Trims less than 170 mm wide shall be tested at their full width as supplied, and shall be tested in the lengthwise direction only.

(d) Where the material is composed of one fabric overlaying another (e.g. quilted fabrics), or a label larger than 10 000 mm^2 in area overlaying the fabric, or a fabric overlaying padding, specimens shall be cut and tested as a combination, i.e. as if the overlay were appliquéd to the under fabric or padding.

(e) Fabric labels smaller than 10 000 mm^2 in area need not be tested for flammability. Larger labels shall be included in the flammability testing.

(f) Where composite materials are used on the child restraint in such a manner that the under fabric or padding is exposed, the combination of overlay and under fabric or padding shall be tested on both surfaces.

NOTE: There are very few trims, in particular trims made from cotton, poly/cotton and nylon lace, that would meet the above requirements.

2.3.2 Other chair materials

When tested in accordance with SAE J369, chair materials other than those covered under Clause 2.3.1 shall not burn nor transmit a flame across the surface at a rate of more than 100 mm/min.

If a material is self-extinguishing within 60 s from the start of timing, and has not burned more than 50 mm from the point where the timing was started, it shall be considered to comply with the above burn-rate requirement.

NOTES:

1 'Chair materials' includes all materials forming the chair except knobs, adjusters, pull-tags and the like.

2 The test method given in SAE J369 is technically equivalent to the test method given in FMVSS 302 and also in ISO 3795.

2.4 TOXICITY

Any part or material that can be reasonably expected to be mouthed or sucked by a child in the restraint, shall comply with the requirements of AS/NZS ISO 8124.3. For the purpose of this Standard, the words 'child restraint component' shall be substituted for the word 'toy'.

NOTE: Mouthed or sucked parts or materials include seat trims, harness webbing, seat chair material and accessories.

2.5 PLASTICS STABILIZATION

Plastics used in main load-bearing mouldings shall be stabilized against UV and thermal degradation.

NOTES:

1 Thermally stabilized plastics will resist degrading when subject to the moulding process and the temperature changes normally encountered in vehicles. Materials like polypropylene are susceptible to rapid thermal degradation. It has nothing to do with capability of the plastic to retain its structural integrity when hot.

2 A load-bearing part is one that has the potential of experiencing tensile, compressive or rotational loads during dynamic testing.

3 Demonstration of compliance to this clause is by testing by a credible laboratory that can report on the addition of appropriate stabilizers or provision of data sheets on the additives stating that they provide both thermal and UV stabilization.

4 Plastics used in child restraints should be designed to achieve a useable life of at least 10 years (when used in accordance with the manufacturer's instructions, and not exposed to extensive periods of sunlight or high temperatures).

SECTION 3 DESIGN AND CONSTRUCTION

3.1 EXTENT OF PROTECTION

The extent of protection of the child provided by the child restraint system is determined by the following criteria:

(a) The child restraint shall be capable of protecting the wearer under the dynamic conditions specified in AS/NZS 3629.1.

(b) The child restraint shall minimize the possibility of hazardous impact with the interior of the vehicle.

NOTE: It is desirable that the child restraint should—

(a) minimize lateral and vertical motion and submarining of the child; and

(b) not permit impact of any portion of the wearer's head, neck and torso with any tensioned adult seatbelt used for securing the child restraint except for child restraints where the adult seatbelt is part of the restraint.

3.2 RESTRAINT SYSTEM

NOTE: Recommended weight and load limits are as follows:

(a) The child restraint should weigh not more than 9 kg.

(b) The force exerted on the top anchorage strap during dynamic testing should be not more than 7 kN.

(c) It is not intended that excessive excursion be the means by which the recommended force limit be met.

3.2.1 General requirements

Restraint systems shall comply with the following general requirements in this Clause and the relevant particular requirements of Clauses 3.2.2 to 3.2.9:

(a) The restraint system shall be usable by one occupant only, at any time.

(b) Any harness shall be designed to minimize roping of the webbing during normal use and in a vehicle impact.

(c) Where adjustable straps are provided, there shall be means to prevent unthreading occurring through the adjustment device.

(d) Any crotch strap shall be designed and located so that it does not load the genital region of the child in a frontal impact.

NOTE: Crotch straps may be adjustable in length.

(e) Normal wearing adjustments shall be possible with the occupant in the restraint system and without loosening, or removal, of the restraint system from the vehicle. This requirement does not apply to adjustments necessary to accommodate occupants of different age groups and heights.

(f) The restraint system shall have adequate adjustments for fitment to every vehicle model and seating position for which it purports to be suitable. Adjustments shall be possible with the system in all intended installed seating positions. Adjustment shall be accomplished without the use of tools.

(g) When the child restraint is installed in a vehicle, the means of harness adjustment for normal wearing shall be accessible to an adult operator. It shall either be visible or its position legibly and permanently marked adjacent to the adjuster. The means of adjustment shall be such that the mechanism returns to the locked position automatically when the adjusting device is released by the operator.

(h) Any harness or other parts of the child restraint that restrains the occupant in the case of a vehicle impact shall be designed to minimize injury to the occupant by absorbing energy or spreading the load, and thereby limiting the restraint loads upon the occupant.

NOTE: Absorbing energy may be achieved by other components, not just the harness in the restraint system.

(i) Harnesses incorporating a releasable chest cross-strap shall provide a strap that is adjustable to a suitable position and remains releasable in that position. The cross-strap shall allow release of the occupant in an emergency by a tear-away action with a force of not more than 80 N.

NOTE: To reduce the possibility of children releasing the cross-strap, the force required to tear the strap away should be at or near the 80 N limit.

(j) Any child restraint recline mechanism shall incorporate a self-locking device. The self-locking device shall not release from any position in which it is set when the child restraint is tested in accordance with AS/NZS 3629.1 except if the manufacturer demonstrates that such release does not adversely affect the performance of the child restraint.

(k) The following applies to liners and covers.

Any removable liner or cover shall be designed so that it can be removed by one of the following methods:

- (i) By not having to remove any part of the harness assembly, or similar part/s of the child restraint.
- (ii) For child restraints fitted with a harness assembly, any part of which has to be removed to remove a liner or cover, the harness assembly shall be designed such that—
  - (A) each shoulder strap is terminated in a loop of webbing;
  - (B) disconnection of each shoulder strap is directly from either—
    - (1) a splitter plate at the back of the restraint that is attached to the harness adjusting strap; or
    - (2) an anchorage bracket fixed to the restraint, close to the shoulder strap slots;
  - (C) disconnection of the shoulder strap is achieved without the use of tools; and
  - (D) the crotch straps or leg straps and quick-release device attached to the straps shall not prevent the liner or cover being removed without the need to remove the straps from the restraint structure.
- (iii) A removable cover designed to fit polystyrene or cellular foam seats or seats lined with polystyrene or cellular foam shall have a means by which the cover can be well secured to the seat, to avoid children gaining access to the polystyrene or cellular foam.

(l) A single length of webbing shall not constitute the harness assembly, i.e. shoulder straps, lap belt and adjuster straps inclusive.

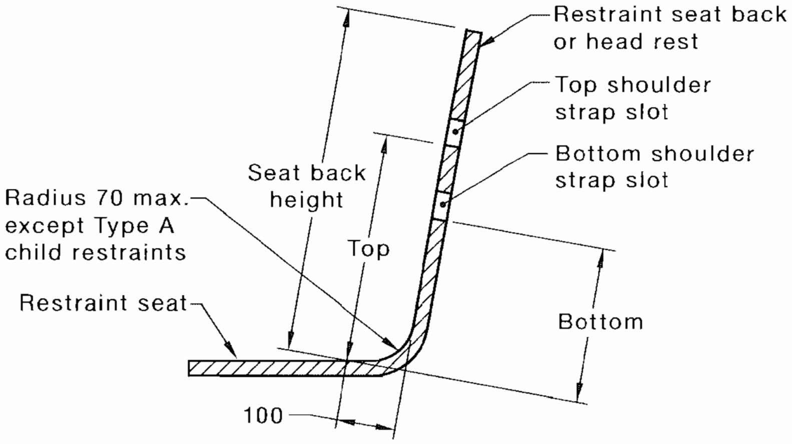
(m) Restraints that are a combination of types shall meet the shoulder strap positions of all the combined types. A single set of shoulder strap positions are permissible if they can be adjusted to conform to the height requirements of all the combined types.

(n) The minimum webbing width for leg or crotch straps shall be 24 mm.

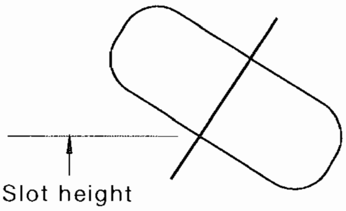
(o) The rigid seat back height shall comply with Figure 3.1 and Table 3.1. Dimensions shall be taken on a plane 100 mm from and parallel to the back plane as shown with seat covers removed.

(p) With the exception of Type C restraints, any structure beside the head that would be sandwiched between the door structure and the dummy's head during the side impact testing specified in Sections 4 and 5 shall have energy attenuating properties.

NOTE: Certifying bodies or manufacturers may nominate a test method to demonstrate adequate energy attenuating properties consistent with protecting children's heads from brain injury. Test methods may be taken from helmet testing using typical velocities experienced in side impact testing in this standard or other national or international test methods.



(a) Dimensions on the seat



(b) Measurement of angled slots in restraint back

NOTES:

1 Measurements to be conducted without covers.

2 Dimensions to be taken on a plane 100 mm from, and parallel to, the back plane.

3 The illustration above shows the shoulder strap heights measured to the bottom of the slot where the shoulder strap would be directed downwards after passing through the slot. For straps that are directed upwards after passing through the slot, the top of the slot shall be used for determining the height.

4 If the shoulder straps pass through two structures then the structure that determines the positioning of the strap on to the shoulder shall be used in determining the shoulder strap slot height.

DIMENSIONS IN MILLIMETRES

FIGURE 3.1 SHOULDER STRAP POSITIONS AND RESTRAINT BACK HEIGHT

TABLE 3.1
SHOULDER SLOT POSITIONS AND SEAT BACK HEIGHT

millimetres

Type designation	Minimum bottom shoulder strap slot		Minimum top shoulder strap slot	Seat back height/head rest height	Slot spacing
	Min.	Max.		Min.	Max.
A1	180	275	290	490	80
A2	180	275	310	525	80
A3	180	275	290	490	80
B	290	365	385	560	80
D	290	365	385	560	80
E (booster seat)	—	—	—	630	—
F	—	—	—	670	—

NOTES:

1 For Type A child restraints, it is desirable that a slot be located at a height of approximately 250 mm and another at approximately 290 to 300 mm.

2 Restraints that are a combination of Type A and Type B may have a lower slot height of 180 mm minimum.

3 Shoulder strap slot locations should be located in such a way as to encourage the use of a restraint up to the maximum height for which a restraint is suitable, rather than at the minimum size for which the next restraint is suitable. For convertible restraints, the transition shoulder strap slot should aim to encourage the use of the restraint in the mode designed for smaller children as long as possible within the size limits of the restraint. For example, for a Type A2/B restraint, the slot position intended for transition from rearward to forward-facing mode should be located so as to encourage rearward-facing use for as long as the restraint is suitable to be used in that mode rather than at the minimum shoulder height for which forward-facing use is permissible.

3.2.2 Type A1 child restraints

The following requirements and recommendations apply to Type A1 child restraints:

(a) Deceleration forces acting upon the occupant during a frontal impact should be distributed as uniformly as is practicable over the back of the occupant's head and torso.

(b) The contact area between a TNO P¾ dummy and any harness shall be not less than 7000 mm^2.

NOTE: This area of contact is that calculated to result in a contact pressure not greater than 175 kPa for a 9 kg dummy subjected to 14*g* deceleration.

(c) The restraint system shall—

  (i) accommodate a TARU Theresa dummy clothed in summer-weight clothing in accordance with Appendix A; and

  (ii) accommodate a TNO P¾ dummy clothed in winter-weight clothing in accordance with Appendix A.

(d) With the TNO P¾ dummy in the child restraint, manually adjusted harnesses shall have not less than 100 mm of material extending from the adjuster, to provide a grip for adjustment purposes.

NOTE: The material may be either attached to, or form part of, the free end of the strap.

(e) Any restraining harness shall have not less than five points of attachment.

(f) The restraining harness shall have not more than one adjuster.

(g) There shall be a minimum of two sets of shoulder strap slots provided or a means of adjusting the shoulder strap height. The position of the slots shall comply with Figure 3.1 and Table 3.1. Any adjusting means shall be capable of being adjusted to heights that comply with Figure 3.1 and Table 3.1.

NOTE: Shoulder strap slot height requirements are intended to ensure that compressive forces on the occupant's shoulders are limited, and are not greater than resultant compressive forces caused by a shoulder strap angled down (and back) 15° to the horizontal plane tangential to the occupant's shoulders.

(h) When measured in accordance with AS/NZS 3629.6, the average recline angle shall be not greater than 40°.

3.2.3 Type A2 child restraints

The following requirements and recommendations apply to Type A2 child restraints:

(a) Deceleration forces acting upon the occupant during a frontal impact should be distributed as uniformly as is practicable over the back of the occupant's head and torso.

(b) The contact area between a TNO P1½ dummy and any harness shall be not less than 12 000 mm^2.

NOTE: This area of contact is that calculated to result in a contact pressure not greater than 175 kPa for a 12 kg dummy subjected to 14*g* deceleration.

(c) The restraint system shall—

  (i) accommodate a TARU Theresa dummy clothed in summer-weight clothing in accordance with Appendix A; and

  (ii) accommodate a TNO P1½ dummy clothed in winter-weight clothing in accordance with Appendix A.

(d) With the TNO P1½ dummy in the child restraint, manually adjusted harnesses shall have not less than 100 mm of material extending from the adjuster, to provide a grip for adjustment purposes.

NOTE: The material may be either attached to, or form part of, the free end of the strap.

(e) Any restraining harness shall have not less than five points of attachment.

(f) Any restraining harness shall have not more than one adjuster.

(g) There shall be a minimum of two sets of shoulder strap slots provided or a means of adjusting the shoulder strap height. The position of the slots shall comply with Figure 3.1 and Table 3.1. Any adjusting means shall be capable of being adjusted to heights that comply with Figure 3.1 and Table 3.1.

NOTE: Shoulder strap slot height requirements are intended to ensure that compressive forces on the occupant's shoulders are limited, and are not greater than resultant compressive forces caused by a shoulder strap angled down (and back) 15° to the horizontal plane tangential to the occupant's shoulders.

(h) When measured in accordance with AS/NZS 3629.6, the average recline angle shall be not greater than 40°.

3.2.4 Type A3 child restraints

The following requirements and recommendations apply to Type A3 restraints:

(a) Deceleration forces acting upon the occupant during a frontal impact should be distributed as uniformly as is practicable over the occupant's head and torso.

(b) The contact area between a TNO P¾ dummy and any harness shall be not less than 7000 mm^2.

NOTE: This area of contact is that calculated to result in a contact pressure not greater than 175 kPa for a 9 kg dummy subjected to 14*g* deceleration.

(c) The restraint system shall—

(i) accommodate a TARU Theresa dummy clothed in summer-weight clothing in accordance with Appendix A; and

(ii) accommodate a TNO P¾ dummy clothed in winter-weight clothing in accordance with Appendix A.

(d) With the TNO P¾ dummy in the child restraint, manually adjusted harnesses shall have not less than 100 mm of material extending from the adjuster to provide a grip for adjustment purposes.

NOTE: The material may either be attached to, or form part of, the free end of the strap.

(e) Any restraining harness shall have not less than five points of attachment.

(f) Any restraining harness shall have not more than one adjuster.

(g) There shall be a minimum of two sets of shoulder strap slots provided or a means of adjusting the shoulder strap height. The position of the slots shall comply with Figure 3.1 and Table 3.1. Any adjusting means shall be capable of being adjusted to heights that comply with Figure 3.1 and Table 3.1.

NOTE: Shoulder strap slot height requirements are intended to ensure that compressive forces on the occupant's shoulders are limited, and are not greater than resultant compressive forces caused by a shoulder strap angled down (and back) 15° to the horizontal plane tangential to the occupant's shoulders.

3.2.5 Type B child restraints

The following requirements and recommendations apply to Type B child restraints:

(a) Deceleration forces acting upon the occupant during a frontal impact should be distributed as uniformly as is practicable over the pelvic region and upper torso.

The harness shall provide pelvic restraint by a small downward pressure on the occupant's upper thighs when tightened, and the deceleration forces on the chest shall be applied principally to the upper skeletal structure.

(b) The contact area between a TNO P3 dummy and the harness shall be not less than 25 000 mm^2.

NOTE: This area of contact is that calculated to result in a contact pressure not greater than 175 kPa for an 18 kg dummy subjected to 24*g* deceleration.

(c) The restraint system shall—

(i) accommodate a TNO P¾ dummy clothed in summer-weight clothing in accordance with Appendix A; and

(ii) accommodate a TNO P6 dummy clothed in winter-weight clothing in accordance with Appendix A.

(d) With the TNO P6 dummy in the child restraint, manually adjusted harnesses shall have not less than 100 mm of material extending from the adjuster, to provide a grip for adjustment purposes.

NOTE: The material may either be attached to, or form part of, the free end of the strap.

(e) The harness shall have not less than five points of attachment to the chair.

(f) There shall be a minimum of two sets of shoulder strap slots provided or a means of adjusting the shoulder strap height. The position of the slots shall comply with Figure 3.1 and Table 3.1. Any adjusting means shall be capable of being adjusted to heights that comply with Figure 3.1 and Table 3.1.

NOTE: Shoulder strap slot height requirements are intended to ensure that compressive forces on the occupant's shoulders are limited, and are not greater than resultant compressive forces caused by a shoulder strap angled down (and back) 15° to the horizontal plane tangential to the occupant's shoulders.

(g) The angle measured between the back of the body block as shown in Figure 3.2 and a vertical plane, shall be not greater than 45° when the child restraint is installed on the test seat specified in AS/NZS 3629.1, for all modes of installation.

(h) When a body block of smooth, hard construction and of the form and nominal dimensions shown in Figure 3.2 is installed in the child restraint, the centre-line of the lap belt shall lie within the shaded area as shown in Figure 3.3.

NOTE: This requirement is intended to ensure that the forces transmitted to the occupant by the lap belt are not applied to the soft tissue area of the lower abdomen.

(i) With the device positioned in its most upright position on the test seat shown in Figure 1 in AS/NZS 3629.1, and with the upper anchorage strap and the attachment clip extended rearward in a horizontal plane over the top of the test seat back, no part of the attachment clip shall pass through the vertical plane XY situated 130 mm from the front edge of the test seat as shown in Detail A of Figure 1 in AS/NZS 3629.1, when the upper anchorage strap is adjusted to its shortest length.

(j) The restraining harness shall have not more than one adjuster.

(k) With the buckle held perpendicular to the seating surface and in the correct orientation, the following apply:

(i) The horizontal distance between the leg straps at the seating surface shall not be less than 40 mm.

The separation of the straps shall be measured across the seating surface without the compression of padding or fabric cover. The fabric may be pressed flat by hand prior to the measurement. Where the straps are not parallel as they exit the seat cover, then the spacing shall be measured at the webbing edge on the side closest to the back of the seat.

(ii) The vertical distance between the seating surface and either the lowest edge of the buckle housing or the top of the leg strap opening, whichever is the lower of the two, shall not be less than 60 mm.

The vertical distance shall be measured by placing the test mass shown in Figure 3.4(a) on the seating surface with the larger width closer to the seat back and the narrow section placed centrally between the leg straps, so that step A of the test mass just contacts the rear edge of the leg straps as shown in Figure 3.4(b). Measure the perpendicular height of either the lowest edge of the buckle housing or the lowest sewing or fastener joining the two straps, with respect to the bottom of the test mass. The distance shall be measured without compression of padding or fabric cover except from the compression induced by the test mass.

NOTE: When evaluating this requirement, follow the manufacturer's instruction when adjusting any device.

(l) The upper anchorage strap shall—

  (i) be permanently attached to the fixed portion of the seat back; and

  (ii) the middle of the strap entry or attachment part to the seat structure shall be at a point not less than 500 mm from the bottom surface of the seat base with the seat in an upright position. The measurement shall be made in the rigid test seat shown in Figure 1 in AS/NZS 3629.8 and the height shall be measured parallel to the back plane of the rigid test seat, from the base of the rigid seat to the middle of the strap entry or attachment part to the seat structure.

3.2.6 Type C child restraints

The following requirements and recommendation apply to Type C child restraints:

(a) Deceleration forces acting upon the occupant during a frontal impact should be distributed as uniformly as is practicable over the pelvic region and upper torso.

(b) The restraint shall have not less than three points of attachment.

(c) The restraint, excluding the adult seatbelt, shall not have more than one adjuster.

(d) With the restraint accommodating a TNO P10 test dummy on the test seat shown in Figure 1 in AS/NZS 3629.1 and with the upper anchorage strap and the attached clip extended rearward in a horizontal plane over the top of the test seat back, no part of the attachment clip shall pass through the vertical plane XY situated 130 mm from the front edge of the test seat shown in Detail A of the Figure 1 in AS/NZS 3629.1, when the upper anchorage strap is adjusted to its shortest length.

NOTE: It is desirable that a rigid component (e.g. adjuster) is not situated between the dummy's head and the front edge of the test seat when the tip of the attachment clip is aligned with the vertical plane XY.

3.2.7 Type D child restraints

The following requirements and recommendations apply to Type D child restraints:

(a) Deceleration forces acting upon the occupant during a frontal impact should be distributed as uniformly as is practicable over the back of the occupant's head and torso.

The harness shall provide pelvic restraint by a small downward pressure on the occupant's upper thighs when tightened, and the decelerating forces on the chest, in a rear impact, shall be applied principally to the upper skeletal structure.

(b) The contact area between a TNO P3 dummy and the harness shall be not less than 14 000 mm^2.

NOTE: This area of contact is that calculated to result in a contact pressure not greater than 175 kPa for an 18 kg dummy subjected to 14*g* deceleration.

(c) The restraint system shall—

  (i) accommodate a TNO P¾ dummy clothed in summer-weight clothing in accordance with Appendix A; and

  (ii) accommodate a TNO P6 dummy clothed in winter-weight clothing in accordance with Appendix A.

(d) With the TNO P6 dummy in the child restraint, manually adjusted harnesses shall have not less than 100 mm of material extending from the adjuster, to provide a grip for adjustment purposes.

NOTE: The material may either be attached to, or form part of, the free end of the strap.

(e) The harness shall have not less than five points of attachment to the chair.

(f) The angle measured between the back of the body block, as shown in Figure 3.2, and a vertical plane, shall be not greater than 45° when the child restraint is installed on the test seat specified in Figure 1 in AS/NZS 3629.1, for all modes of installation.

(g) There shall be a minimum of two sets of shoulder strap slots provided or a means of adjusting the shoulder strap height. The position of the slots shall comply with Figure 3.1 and Table 3.1. Any adjusting means shall be capable of being adjusted to heights that comply with Figure 3.1 and Table 3.1

NOTE: Shoulder strap slot height requirements are intended to ensure that compressive forces on the occupant's shoulders are limited, and are not greater than resultant compressive forces caused by a shoulder strap angled down (and back) 15° to the horizontal plane tangential to the occupant's shoulders.

(h) The restraining harness shall have not more than one adjuster.

3.2.8 Type E child restraints

The following requirements apply to Type E child restraints:

(a) The restraint system shall—

(i) accommodate a TNO P3 dummy clothed in summer-weight clothing in accordance with Appendix A.

(ii) accommodate a TNO P6 dummy clothed in winter-weight clothing in accordance with Appendix A, with spacers as specified in Appendix B positioned between the upper arms of dummy and the child restraint and between the upper legs of the dummy and the child restraint, as shown in Appendix B.

(b) The restraint of the child occupant shall be provided by means of an adult lap-sash seatbelt, or a Type C child harness and seatbelt.

(c) Booster seats shall be restrained so that they will not become dislodged during dynamic testing. Where booster seats are indirectly restrained through the body of the child, the child and booster seat shall be restrained simultaneously.

(d) The maximum permissible mass of booster seats shall be not more than 2 kg except when attachment to an upper anchorage point is provided by an upper anchorage strap designed to restrain the back of the booster seat in a vehicle impact. If the booster seat is fitted with an upper anchorage strap, the total mass of the booster seat excluding the mass of the upper anchorage strap, adjustment device and attachment clip external to the seat structure shall be not more than 7.5 kg, and the mass of the back of the booster seat shall be not more than 5.5 kg.

(e) The design of the booster seat shall be such that, when fitted in accordance with the manufacturer's instructions and in normal driving conditions, there is reduced propensity for the child occupant to slip off the booster seat when asleep, or wriggle off the booster seat when active.

(f) Where the booster seat incorporates foam thicker than 30 mm, either singly or compositely on or beneath the seating surface, the seating surface shall be subjected to 175 N ±5% pre-load force normal to the seating surface and allowed to stabilize for 30 s followed by 2250 N ±5% test force, applied to the seating surface through the indentor apparatus described in AS 2282.8, so that the outer edges of the indentor apparatus disc are within 10 mm of the side and front edges of the seating surface.

When the test force is applied there shall not be more than 32 mm deflection from the stabilized position of the indentor.

(g) Booster seats that are fitted with an upper anchorage strap shall comply with the requirement that, with the device positioned in its most upright position on the test seat shown in Figure 1 in AS/NZS 3629.1 and with the upper anchorage strap and attachment clip extended rearward in a horizontal plane over the top of the test seat back, no part of the attachment clip shall pass through the vertical plane XY situated 130 mm from the front edge of the test seat as shown in Detail A of Figure 1 in AS/NZS 3629.1 when the upper anchorage strap is adjusted to its shortest length.

(h) With the child restraint installed on the test seat specified in AS/NZS 3629.1, the booster seat sash guide shall not inhibit retraction of the sash belt.

(i) The upper anchorage strap shall—

  (i) be permanently attached to the fixed portion of the seat back; and

  (ii) be attached to the seat structure at a point not less than 370 mm from the bottom surface of the seat base with the seat in an upright position. The measurement shall be made in the rigid test seat shown in Figure 1 in AS/NZS 3629.8 and the height shall be measured parallel to the back plane of the rigid test seat, from the base to the middle of the strap entry or attachment part to the seat structure.

(j) With an unclothed TNO P6 dummy in the restraint placed on the rigid test seat as specified in AS/NZS 3629.8, and adjusted in accordance with the manufacturer's instructions with the lap-sash belt only, the seatbelt position shall comply with the following in both the most reclined and the most upright position of the restraint:

  (i) The top edge of the lap belt shall not be more than 20 mm above the top edge of the rigid portion of the dummy's pelvis, when measured at the midline of the dummy's pelvis.

  NOTE: The position of the lap belt is determined by the average of three fittings of the seatbelt.

  (ii) A minimum of 160 mm of the sash belt shall be in contact with the dummy's upper torso segment. This contact region is defined from the first point of contact between the sash belt and the dummy's upper torso segment to the last point of contact between the sash belt and the dummy's upper torso segment.

  (iii) If a sash guide is used to achieve (ii), it shall be permanently fixed to the restraint and capable of being used on both the left and right shoulders (but not necessarily simultaneously).

  (iv) If a belt positioning device that attaches to the lap belt is used to achieve (i), it shall be permanently attached to the restraint.

In applying the lap belt it shall be routed over the upper thighs of the dummy and a 200 N force shall be used to tension the lap belt and then the sash belt in the direction to eliminate slack before observations are made.

NOTE: If the lap belt tends to stick on, or grip the surface of the dummy, a piece of thin slippery fabric may be added between the dummy and the belt.

(k) When measured in accordance with AS/NZS 3629.9 the angle between the plane of the upper thigh and the shin of the dummy's leg shall not be less than 45° for upright and reclined modes of installation as shown in Figure 3.5(B).

(l) The height of the head support of the backrest shall comply with Figure 3.1 and Table 3.1. Where the headrest is adjustable it shall be measured in the fully extended position according to the manufacturer's instructions.

(m) If a restraint includes a device between the legs to position the lap belt the following applies:

  (i) The horizontal distance between the leg straps at the seating surface shall be not less than 40 mm.

  With the leg straps and associated device held perpendicular to the seating surface, separation of the straps shall be measured across the seating surface without the compression of padding or fabric cover. The fabric may be pressed flat by hand prior to the measurement. Where the straps are not parallel as they exit the seat cover then the spacing shall be measured at the webbing edge on the side closest to the back of the seat.

  (ii) The vertical distance between the seating surface and either the lowest edge of the associated device or the top of the leg strap opening shall be not less than 60 mm.

  With the straps and associated device held perpendicular to the seating surface, the vertical distance shall be measured by placing the test mass shown in Figure 3.4(a) on the seating surface with the larger width closer to the seat back and the narrow section placed centrally between the leg straps so that step A of the test mass just contacts to rear edge of the leg straps as shown in Figure 3.4(b). Measure the perpendicular height of either the lowest edge of the associated device or the lowest sewing or fastener joining the two straps, with respect to the bottom of the test mass. The distance shall be measured without compression of padding or fabric cover except from the compression induced by the test mass.

  (iii) The device shall be permanently attached to the restraint.

  (iv) The leg straps shall be adjustable to allow the device to correctly locate the lap belt on the occupant's hips and thighs.

  NOTE: When evaluating this requirement, follow the manufacturer's instructions when adjusting this device.

(n) The width or spacing of the path for a child harness shall be such that it does not cause the inside edges of the shoulder straps of a Type C child harness to be spaced more than 100 mm apart. This measurement is taken with a TNO P6 dummy in the seat. The measurement is taken at a point at the rear of the dummy's neck.

3.2.9 Type F child restraints

3.2.9.1 *Type F – booster seats*

The following requirements apply to Type F booster seats:

(a) The restraint system shall—

  (i) accommodate a TNO P3 dummy clothed in summer-weight clothing in accordance with Appendix A; and

  (ii) accommodate a TNO P10 dummy clothed in winter weight clothing in accordance with Appendix A, with the back of the dummy flat against the back of the child restraint and upper arms positioned in accordance with Appendix B using the 19 mm bar.

  NOTE: The spacers specified in Appendix B do not apply for this test.

(b) When the booster seat is positioned on the rigid test seat as specified in AS/NZS 3629.9 in its most upright mode and with a TNO P10 test dummy seated in the booster seat, the distance between the centre of the accelerometer mounting block bolt of the dummy and the base of the booster seat when measured perpendicularly as shown in Figure 3.5(A), shall not be more than 815 mm. Assessment shall be carried out with the cover on.

(c) The restraint of the child occupant shall be provided by means of an adult lap-sash seatbelt, or a Type C child restraint and seatbelt.

(d) Booster seats shall be restrained so that they will not become dislodged during dynamic testing. Where booster seats are indirectly restrained through the body of the child, the child and booster seat shall be restrained simultaneously.

(e) When measured in accordance with AS/NZS 3629.9 the angle between the plane of the upper thigh and the shin of the dummy's leg shall not be less than 45° for upright and reclined modes of installation as shown in Figure 3.5(B).

(f) The booster seat shall have a profile that will fit within the gauge blocks spaced at 450 mm when tested in accordance with AS/NZS 3629.8.

(g) The design of the booster seat shall be such that, when fitted in accordance with the manufacturer's instructions and in normal driving conditions, there is reduced propensity for the child occupant to slip off the booster seat when asleep, or wriggle off the booster seat when active.

(h) Either torso or shoulder support or both shall be provided to support the occupant from lateral movement in everyday use. The backrest shall have rigid lateral supports attached to each side of the seat such that the supports are substantially perpendicular to the backrest. The minimum projected area of the lateral support shall have a depth of at least 120 mm when measured at right angles to the backrest and maintain this depth for a height of at least that nominated in Figure 3.6.

    The minimum height of the support shall be measured parallel to the centre-line of the backrest at a distance from the seating surface as nominated in Figure 3.6.

    The lateral support structure may have an aperture or apertures in the structure, provided that the measured projected area is not less than 13 500 mm^2.

    Where the lateral support is movable then it shall be rigidly connected to a moving backrest or moving headrest structure so that the combination moves simultaneously when adjusted. Separately adjusted lateral supports are not permitted.

    NOTE: Apertures in lateral supports should not allow the shoulder to penetrate during a crash.

(i) With an unclothed TNO P10 dummy in the restraint placed on the rigid test seat as specified in AS/NZS 3629.8, and adjusted in accordance with the manufacturer's instructions with the lap-sash belt only, the seatbelt position shall comply with the following in both the most reclined and the most upright position of the restraint:

    (i) The top edge of the lap belt shall not be more than 20 mm above the top edge of the rigid portion of the dummy's pelvis, when measured at the midline of the dummy's pelvis.

    NOTE: The position of the lap belt is determined by the average of three fittings of the seatbelt.

(ii) A minimum of 160 mm of the sash belt shall be in contact with the dummy's upper torso segment. This contact region is defined from the first point of contact between the sash belt and the dummy's upper torso segment to the last point of contact between the sash belt and the dummy's upper torso segment.

(iii) If a sash guide is used to achieve (ii), it shall be permanently fixed to the restraint and capable of being used on both the left and right shoulders (but not necessarily simultaneously).

(iv) If a belt positioning device that attaches to the lap belt is used to achieve (i), it shall be permanently attached to the restraint.

In applying the lap belt it shall be routed over the upper thighs of the dummy and a 200 N force shall be used to tension the lap belt and then the sash belt in the direction to eliminate slack before observations are made.

NOTE: If the lap belt tends to stick on, or grip the surface of the dummy, a piece of thin slippery fabric may be added between the dummy and the belt.

(j) The maximum permissible mass of booster seats shall be not more than 2 kg except when attachment to an upper anchorage point is provided by an upper anchorage strap designed to restrain the back of the booster seat in a vehicle impact. If the booster seat is fitted with an upper anchorage strap, the total mass of the booster seat excluding the mass of the upper anchorage strap, adjustment device and attachment clip external to the seat structure, shall be not more than 7.5 kg, and the mass of the back of the booster seat shall be not more than 5.5 kg.

(k) Where the booster seat incorporates foam thicker than 30 mm, either singly or compositely on or beneath the seating surface, the seating surface shall be subjected to 175 N ±5% pre-load force normal to the seating surface and allowed to stabilize for 30 s followed by 2250 N ±5% test force, applied to the seating surface through the indentor apparatus described in AS 2282.8, so that the outer edges of the indentor apparatus disc are within 10 mm of the side and front edges of the seating surface.

When the test force is applied there shall be not more than 32 mm deflection from the stabilized position of the indentor.

(l) Booster seats that are fitted with an upper anchorage strap shall comply with the requirement that, with the device positioned in its most upright position on the test seat shown in Figure 1 in AS/NZS 3629.1 and with the upper anchorage strap and attachment clip extended rearward in a horizontal plane over the top of the test seat back, no part of the attachment clip shall pass through the vertical plane XY situated 130 mm from the front edge of the test seat as shown in Detail A of Figure 1 in AS/NZS 3629.1 when the upper anchorage strap is adjusted to its shortest length.

(m) With the child restraint installed on the test seat specified in AS/NZS 3629.1, the booster seat sash guide shall not inhibit retraction of the sash belt.

(n) If a restraint includes a device between the legs to position the lap belt the following apply:

(i) The horizontal distance between the leg straps at the seating surface shall be not less than 40 mm.

With the leg straps and associated device held perpendicular to the seating surface, separation of the straps shall be measured across the seating surface without the compression of padding or fabric cover. The fabric may be pressed flat by hand prior to the measurement. Where the straps are not parallel as they exit the seat cover then the spacing shall be measured at the webbing edge on the side closest to the back of the seat.

(ii) The vertical distance between the seating surface and either the lowest edge of the associated device or the top of the leg strap opening shall be not less than 60 mm.

With the straps and associated device held perpendicular to the seating surface, the vertical distance shall be measured by placing the test mass shown in Figure 3.4(a) on the seating surface with the larger width closer to the seat back and the narrow section placed centrally between the leg straps so that step A of the test mass just contacts to rear edge of the leg straps. Measure the perpendicular height of either the lowest edge of the associated device or the lowest sewing or fastener joining the two straps, with respect to the bottom of the test mass. The distance shall be measured without compression of padding or fabric cover except from the compression induced by the test mass.

(iii) The device shall be permanently attached to the restraint.

(iv) The leg straps shall be adjustable to allow the device to correctly locate the lap belt on the occupant's hips and thighs.

NOTE: Follow the manufacturer's instructions when adjusting any adjusting device.

(o) The upper anchorage strap shall—

(i) be permanently attached to the fixed portion of the seat back, and

(ii) be attached to the seat structure at a point not less than 370 mm from the bottom surface of the seat base with the seat in an upright position. The measurement shall be made in the rigid test seat shown in Figure 1 in AS/NZS 3629.8 and the height shall be measured parallel to the back plane of the rigid test seat, from the base to the middle of the strap entry or attachment part to the seat structure.

(p) The height of the head support of the backrest shall comply with Figure 3.1 and Table 3.1. Where the headrest is adjustable it shall be measured in the fully extended position according to the manufacturer's instructions.

(q) The width or spacing of the path for a child harness shall be such that it does not cause the inside edges of the shoulder straps of a Type C child harness to be spaced more than 100 mm apart. This measurement is taken with a TNO P6 dummy in the seat. The measurement is taken at a point at the rear of the dummy's neck.

3.2.9.2 *Type F – converters*

The following requirements apply to Type F converters:

(a) The restraint system shall—

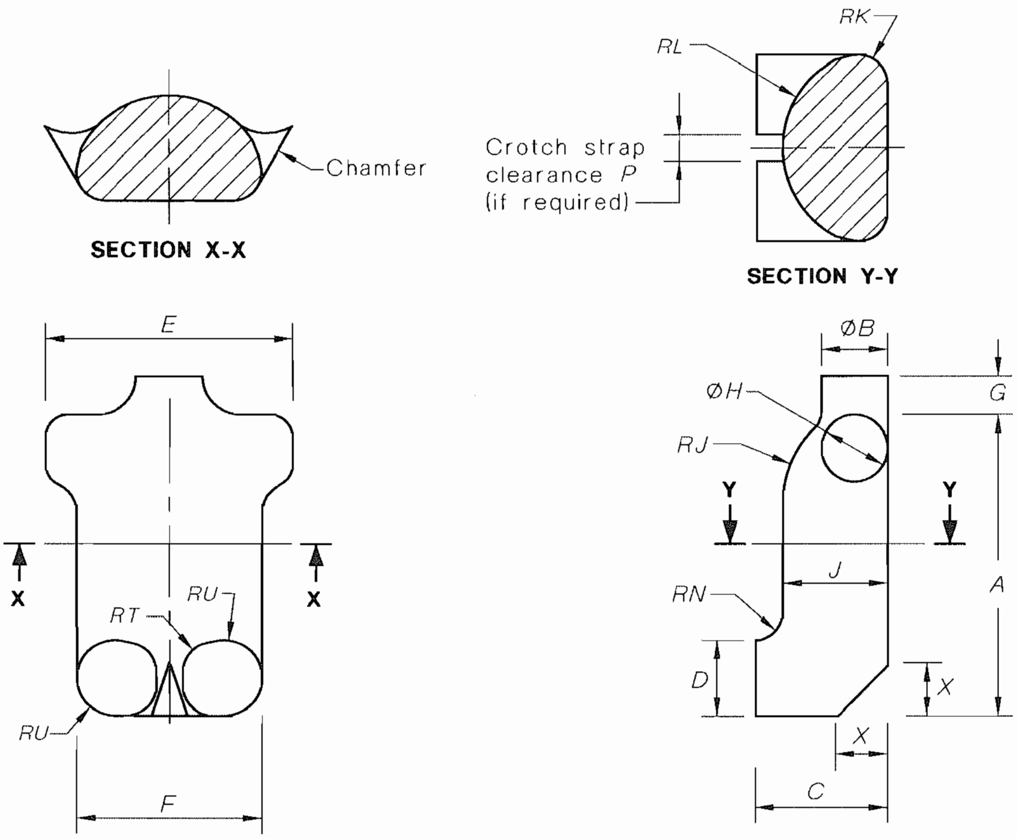
(i) accommodate a TNO P6 dummy clothed in summer-weight clothing in accordance with Appendix A; and

(ii) accommodate a TNO P10 dummy clothed in winter weight clothing in accordance with Appendix A, with the back of the dummy flat against the back of the child restraint and upper arms positioned in accordance with Appendix B using the 19 mm bar.

NOTE: The spacers specified in Appendix B do not apply for this test.

(b) The restraint of the child occupant shall be provided by means of an adult lap-sash seatbelt.

(c) With the child restraint installed on the test seat specified in AS/NZS 3629.1, the converter shall not inhibit retraction of the sash belt.



Nominal body block mass = 18 kg

NOMINAL DIMENSIONS

Dimensions	mm	Dimensions	mm	Dimensions	mm
A	400	*G*	51	*N*	38
B	89	*H*	89	*P*	35
C	177	*J*	140	*T*	40
D	100	*K*	38	*U*	50
E	330	*L*	133	*X*	70
F	247	*M*	65		

FIGURE 3.2 BODY BLOCK

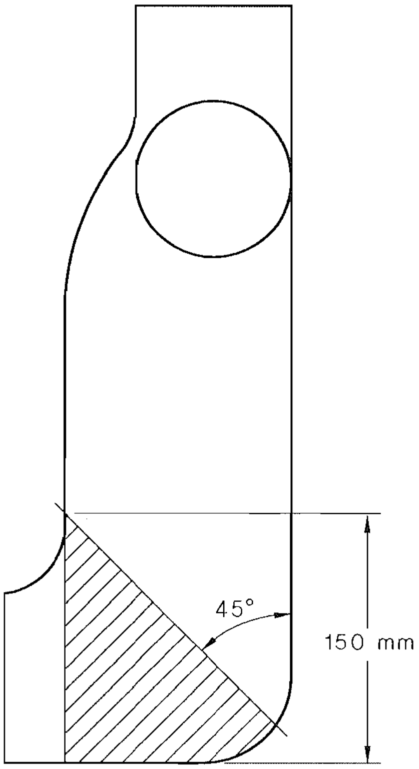
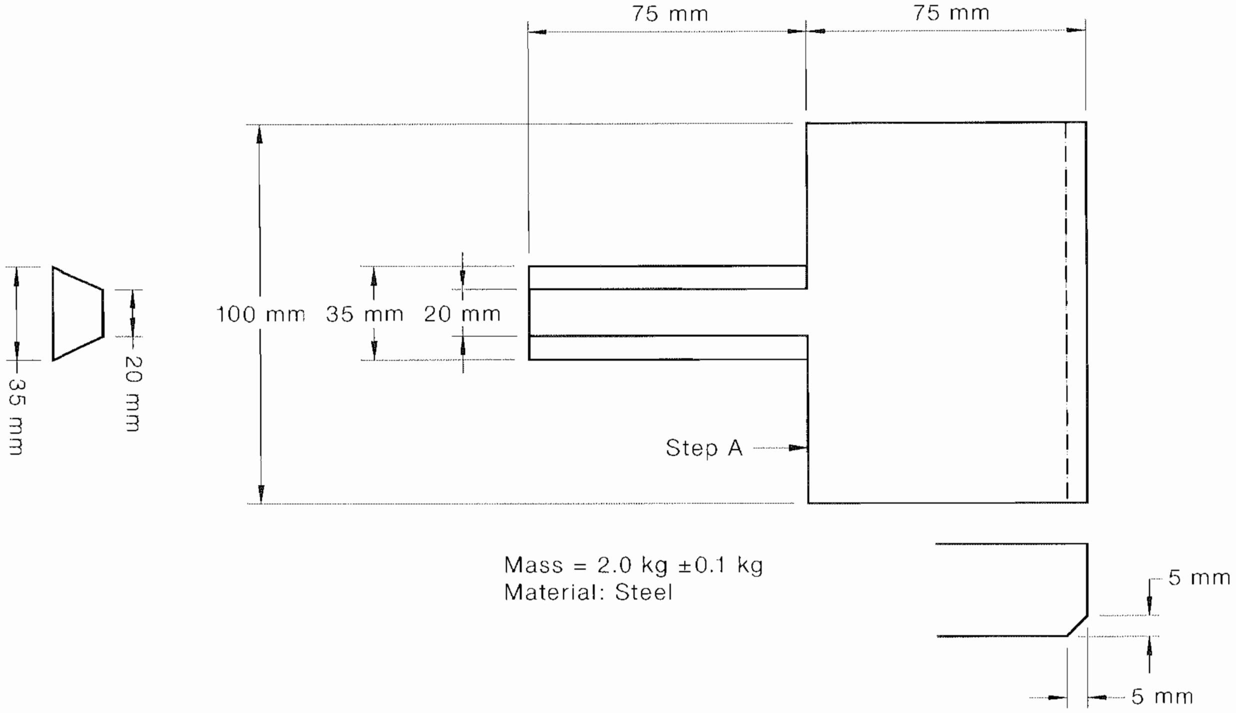
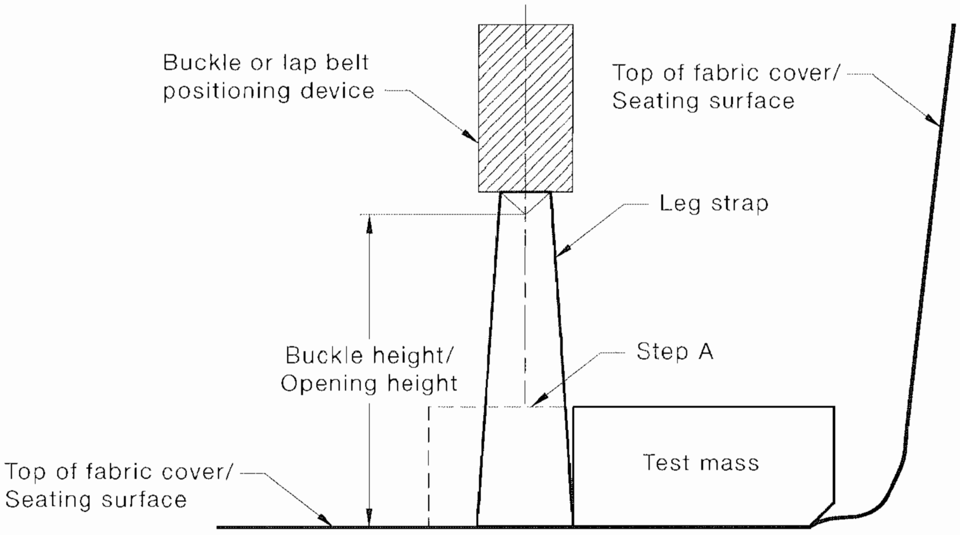


FIGURE 3.3 POSITION OF LAP BELT



(a) Test mass


Buckle or lap belt positioning device
Top of fabric cover/ Seating surface
Leg strap
Buckle height/ Opening height
Step A
Test mass
Top of fabric cover/ Seating surface

(b) Test mass positioning

FIGURE 3.4 TEST MASS AND POSITIONING

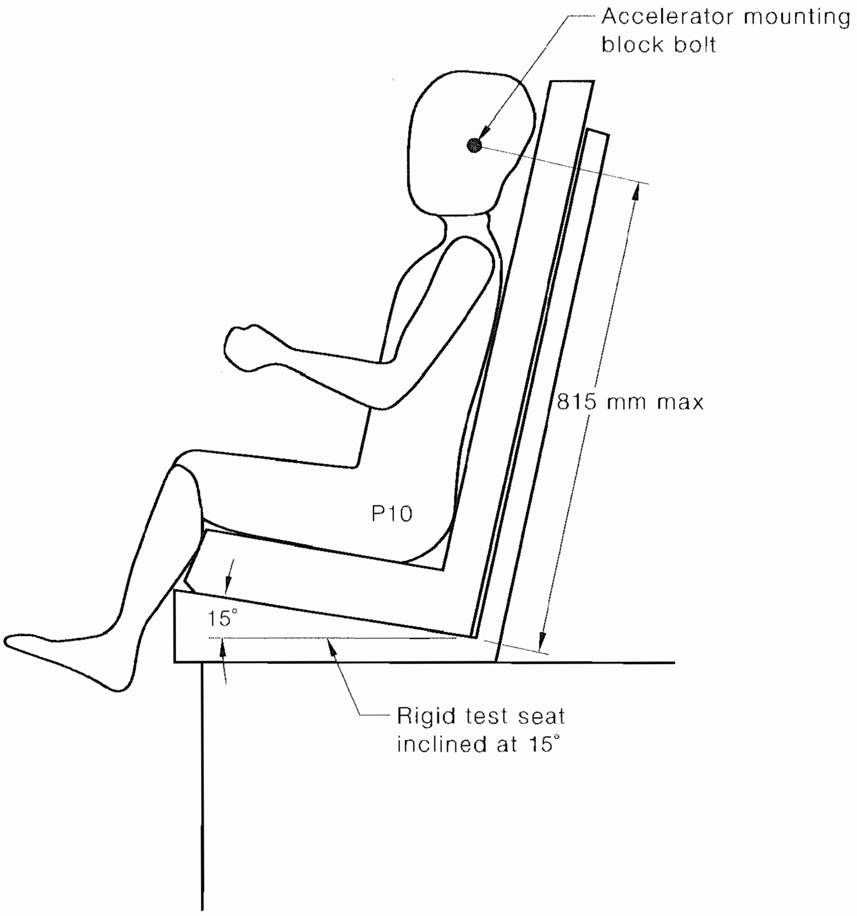

Accelerator mounting block bolt
815 mm max
P10
15°
Rigid test seat inclined at 15°

FIGURE 3.5(A) SEAT BACK HEIGHT REQUIREMENT AND OVERALL BOOSTER HEIGHT REQUIREMENT

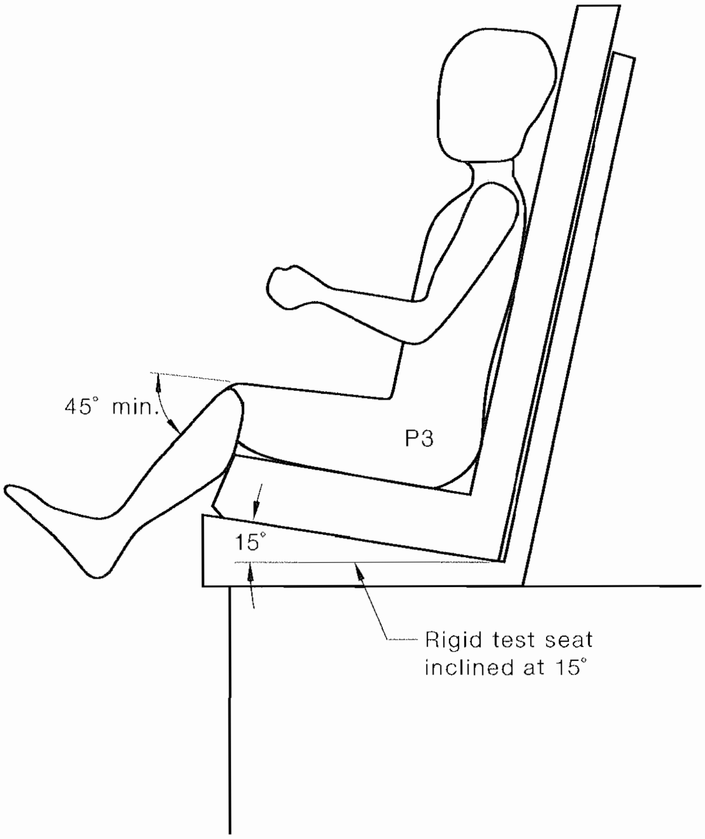
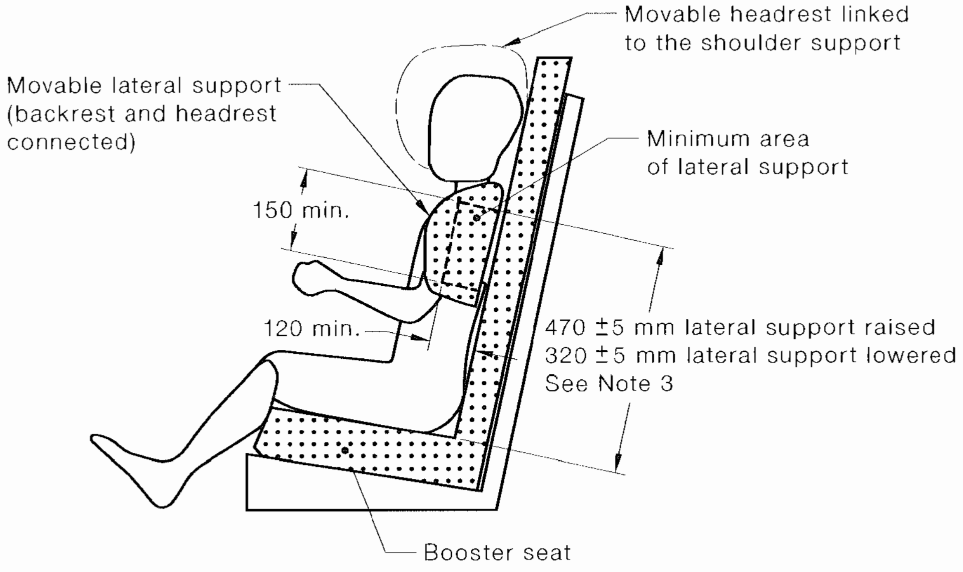
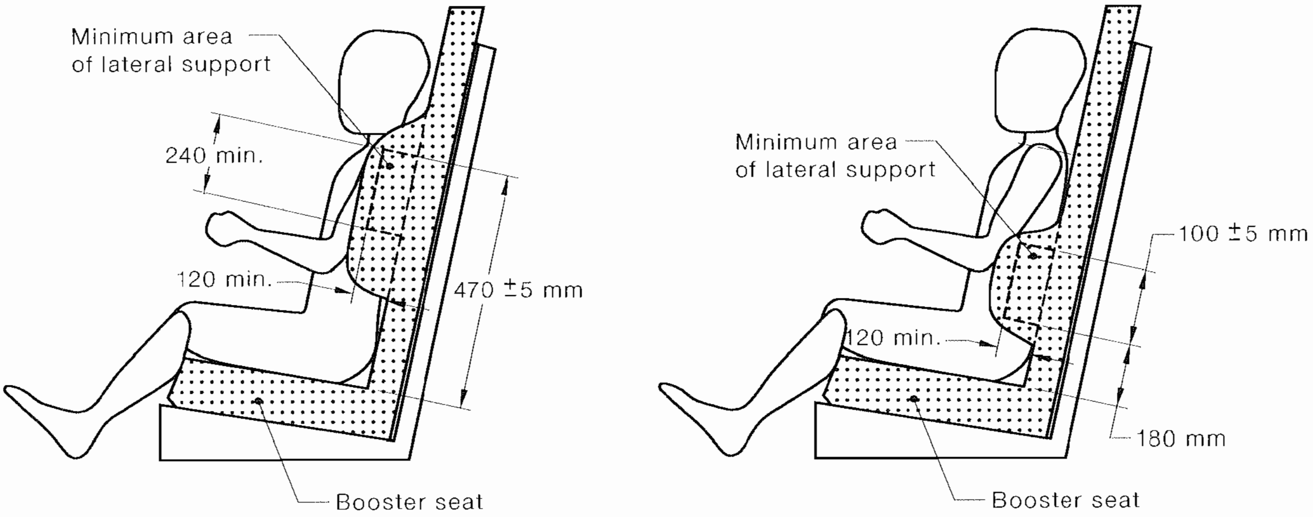


FIGURE 3.5(B) LENGTH OF SEATING SURFACE REQUIREMENT


Movable headrest linked to the shoulder support
Movable lateral support (backrest and headrest connected)
Minimum area of lateral support
150 min.
120 min.
470 ±5 mm lateral support raised
320 ±5 mm lateral support lowered
See Note 3
Booster seat

(a) Shoulder support with movable support structure

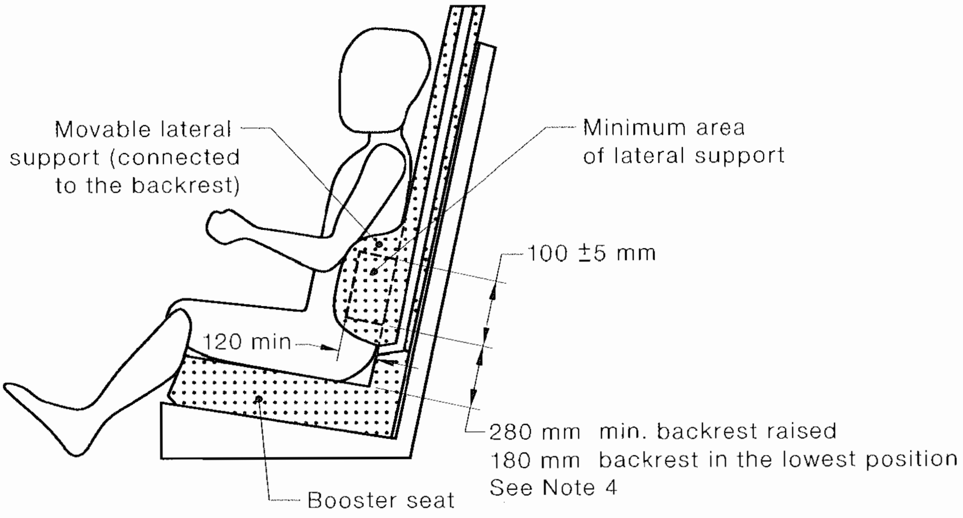


(b) Shoulder support - Fixed side

(c) Torso support

DIMENSIONS IN MILLIMETRES

FIGURE 3.6 (in part) BOOSTER SEAT REQUIREMENT


Movable lateral support (connected to the backrest)
Minimum area of lateral support
100 ±5 mm
120 min
280 mm min. backrest raised
180 mm backrest in the lowest position
See Note 4
Booster seat

(d) Torso support attached to a movable backrest

NOTES:

1 Measurements to be conducted without covers.

2 Length dimensions are to be taken on a plane 100 mm from and parallel to the back plane.

3 The headrest or backrest need not be fully extended.

4 The backrest need not be fully raised to meet the area requirements.

DIMENSIONS IN MILLIMETRES

FIGURE 3.6 (in part) BOOSTER SEAT REQUIREMENT

3.3 SECURING DEVICE

Securing devices shall comply with the following:

(a) Positive means shall be provided to prevent the removal of webbing from a securing device.

NOTE: An adjuster may be incorporated in a securing device.

(b) If a securing device can be engaged in alternative ways, the child restraint shall comply with this Standard in each mode of engagement.

3.4 QUICK-RELEASE DEVICE

3.4.1 General

With the exception of Type C, Type E and Type F child restraints where an adult seatbelt provides the buckling device, the child restraint shall include a quick-release device complying with the following:

(a) Separation of the restraint components shall be achieved by pressing an actuation surface on a quick-release device.

(b) The quick-release device shall be designed, constructed, and fitted, so that the child can be quickly released from the child restraint by the operation, solely, of that device. Where a releasable chest cross-strap is fitted to the harness, the operation shall be assessed after release of the chest cross-strap.

(c) The quick-release device shall not rely on tensioning of the restraint to maintain the engaged condition.

(d) Separation of the quick-release device components shall enable the occupant to be released from the child restraint without having to unthread the harness straps and without having to remove the child restraint from the vehicle. Where the restraint system incorporates any straps passing between the occupant's thighs, the straps shall be released on separation of the harness buckle components. The need to lift straps from the occupant's shoulder or thighs shall not be taken as unthreading of harness straps.

(e) Where the quick-release device can be assembled in alternative ways, the quick-release device shall comply with the requirements of this Standard in each mode of assembly. This requirement shall not apply to modes where the harness is obviously incorrectly arranged or assembled.

NOTE: A twisted strap mode is not intended to be disregarded.

(f) When a buckle is used as the quick-release device, the following shall apply:

  (i) If the actuation surface is enclosed, the actuation surface shall be not less than 350 mm^2 in area, and not less than 15 mm at every width.

  (ii) A single pressing operation shall permit the components of the quick-release device to disengage.

  (iii) The point of actuation shall be at the geometric centre of the actuation surface.

  (iv) When tested in accordance with AS/NZS 3629.5, the average initial force required to operate the release actuator and the average force required to operate the release actuator after 5000 operations shall be not less than 40 N and not more than 80 N.

  NOTE: The quick-release device should be designed so that it cannot be operated easily by a child under the age of 3 years.

  (v) The colour of the actuation surface of the quick-release device shall be red or orange.

  The colour of the external surfaces of the quick-release device, other than the actuation surface, shall not be red or orange.

  NOTES:

  1 For the purpose of this requirement, colours acceptable as red or orange include the following, as defined in AS 2700:

R11	International Orange
R12	Scarlet
R13	Signal Red
R14	Waratah
R15	Crimson

  2 Bright shades with good contrast to surrounding surfaces should be used.

  (vi) When the buckle is placed horizontally on a level plane and the actuating device is operated, the buckle tongues shall eject from the buckle latching mechanism. The buckle tongues shall have a minimum movement of 5 mm when being ejected.

(vii) The buckle shall not have a potential for inadvertent release by the vehicle occupants.

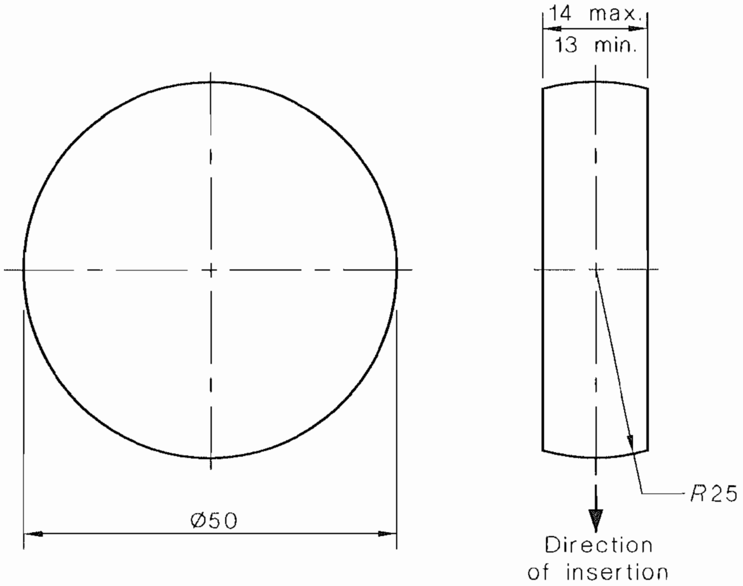
With the buckle tongues engaged in the buckle, they shall not be released by a tool manufactured from rigid material, as shown in Figure 3.7, being inserted in the opening in the buckle housing for the release button. The force applied to the tool shall be sufficient to depress the release button so that either—

(A) the buckle tongues are released; or

(B) the tool is just supported by the buckle housing.

Where the opening is rectangular in shape, the tool shall be inserted so that its sides are parallel to the longer sides of the opening.

Where the opening is irregular in shape, the tool shall be inserted along the widest part of the opening.



DIMENSIONS IN MILLIMETRES

FIGURE 3.7 TOOL FOR TESTING BUCKLE FOR INADVERTENT RELEASE POTENTIAL

(g) When the quick-release device is not a buckle, the following shall apply:

(i) For Type A1 and Type A2 restraints, the quick-release device shall be located over the front torso region of the occupant.

(ii) For Type A3 restraints, the quick-release device shall be located over the front torso region of the occupant with the occupant in the supine position.

(iii) The release area of the quick-release device shall be a different colour to the external surfaces of the quick-release device and shall have a high level of visual contrast with the adjacent surfaces of the quick-release device.

(iv) The word 'PRESS' or 'PULL' as appropriate, or arrows (or both) indicating the actuating action shall appear on the actuation surface of the quick-release device, and shall be legible and durable.

3.4.2 Type A1, Type A2, Type A3, Type B and Type D child restraints

Where a buckle is used as a quick-release device, the buckle tongues shall not extend above the pelvic area and they shall be located on the vertical centre-line over the pelvic area of the occupant.

3.5 ANCHORING AND ATTACHMENT SYSTEM

3.5.1 Provision of anchoring system

Child restraints shall comply with the following:

(a) The child restraint shall be designed for anchoring to the vehicle frame or body.

(b) The connection of the upper anchorage strap to the upper anchorage fitting on the vehicle, shall have an upper attachment clip in accordance with Clause 3.5.2.4.

(c) The anchoring system shall anchor the child restraint securely against deceleration in forward, rearward and sideways directions, and when inverted.

NOTE: The design of the child restraint should ensure that the geometry of the adult seatbelt assembly will minimize the amount of forward excursion.

(d) Except for Type E and Type F restraints weighing below 2 kg and Type C restraints, the upper portion of the child restraint shall be designed to be attached to the vehicle through an upper anchorage strap and fittings, which shall be provided with the child restraint. The webbing of the upper anchorage strap shall be attached to, but need not be permanently fixed on, the child restraint.

For Type A1 and A2 restraints, the upper anchorage strap may be separable into two parts. The connection point for a two piece tether shall be within 250 mm of the XY plane shown in Detail A, Figure 1 of AS/NZS 3629.1. The connection point on the portion of the upper anchorage strap attached to the restraint shall be either of the following:

(i) In accordance with Figure 3.10, Detail A and Figure 3.11. The remaining portion of the upper anchorage strap shall have an upper anchorage attachment clip in accordance with Clause 3.5.2.4 on both ends.

(ii) A quick-release device in accordance with Clause 3.4.1.

(e) Type C harnesses shall have an upper attachment clip permanently fixed to the harness for connection to the vehicle.

(f) The lower portion of the child restraint shall be designed to be attached to the vehicle through an adult seatbelt. Where a separate locking clip device is supplied with the child restraint, the child restraint shall demonstrate compliance with the Standard without the locking clip in place. A locking clip shall not be provided without appropriate fitting instructions.

(g) When tested in accordance with AS/NZS 3629.7 the following shall apply:

(i) For Type A1, A2, A3, B and D child restraints and Type E and Type F booster seats, the length of seatbelt when fitted in accordance with the manufacturer's instruction shall not exceed the length determined by the test method specified in AS/NZS 3629.7. The child restraint shall be tested in each configuration that it is intended to be used including recline.

(ii) For Type E and Type F booster seats when they are used in conjunction with Type C child restraints, the length of seatbelt when fitted in accordance with the manufacturer's instructions shall not exceed the length determined by the test method specified in AS/NZS 3629.7 when using the appropriate dummy.

The combination of booster seat and Type C child harness shall be tested in each configuration that is intended to be used, including recline. The combination of booster seat and Type C child harness may be exempt from testing in recline where the instructions and packaging include printed information in accordance with Clause 6.3(j).

(iii) For Type C child harnesses and Type F converters, the length of seatbelt when fitted in accordance with the manufacturer's instructions shall not exceed the length determined by the test method specified in AS/NZS 3629.7.

(h) The design of the components of the anchoring system shall be such that the child restraint is transferable between vehicles fitted with similar adult seatbelts.

(i) The child restraint anchoring system shall include fasteners for attaching the child restraint to the vehicle body, and any parts that are required to reinforce the vehicle at the anchorage points.

NOTE: These additional parts are required for vehicles not complying with the child restraint anchorage requirements of Australian Design Rules for Motor Vehicles.

(j) Anchorage components supplied with the child restraint shall include the following:

(i) 1 × Grade 5 Class 2A hexagon headed set screw (see Clause 3.5.2.2) with a 30 mm long 18 UNC thread of $^5/_{16}$ in—18 UNC. The length of the thread shall be measured from the underside of the head to the end of the threaded shank.

(ii) A helical spring lock washer for loose, over-the-thread applications of nominal size $^5/_{16}$ in as set down in ASME B18.21.1.

(iii) 1 × $^5/_{16}$ in hexagon nut with 18 UNC thread.

(iv) 1 × round or rectangular steel reinforcing washer of nominal thickness 2 mm. The contact area of the washer shall be not less than 1200 mm^2 and its projected surface area in plan view shall be not greater than 2200 mm^2. The washer shall have a hole with a diameter of 8.25 mm to 8.75 mm, and the periphery of the hole shall be not less than 10 mm from any edge.

(v) 1 × 5 mm thick metal spacer (see Figure 3.8).

(vi) 1 × 10 mm thick metal spacer (see Figure 3.8).

(vii) 1 × upper anchor fitting in accordance with Clause 3.5.2.3.

NOTES:

1 A typical child restraint anchorage assembly is shown in Figure 3.9.

2 Extension straps required for specific installations may be supplied separately.

3 Anchorage components should also be available separately to enable the child restraint to be easily transferable from one vehicle to another.

(k) With the exception of those permitted for Type A1 and A2, extension straps shall have a connection point at one end in accordance with Figure 3.10 Detail A and Figure 3.11, and an upper attachment clip in accordance with Clause 3.5.2.4 at the other end and connected by webbing. An adjuster may be provided to adjust the length.

3.5.2 Requirements for the anchorage components

3.5.2.1 *Webbing*

The following shall apply:

(a) The webbing of the upper anchorage strap shall be permanently attached to, but need not be fixed in position on, each anchorage component.

(b) The upper anchorage strap shall have a means of adjustment to tighten the strap.

(c) The anchorage components shall not appreciably load the webbing off-centre during forward or rearward decelerations to the vehicle.

3.5.2.2 *Set screw*

The set screw for upper anchorages shall be a $^{5}/_{16}$ in—18 UNC hexagon-headed set screw in accordance with the following:

(a) The set screw shall meet a minimum breaking load of 25 kN when tested in accordance with tensile strength (wedge) testing of full-size bolts and screws in AS/NZS 2465.

(b) Any set screw that has been plated shall be thermally treated to remove hydrogen embrittlement.

3.5.2.3 *Upper anchor fitting*

The upper anchor fitting shall comply with the following:

(a) The profile of the fitting shall fit wholly within the areas shown in Figure 3.10.

(b) The anchor fitting shall be designed so that the upper attachment clip provided shall be capable of engaging the anchor fitting interface profile, with the main body of the upper attachment clip aligned with the longitudinal centre-line of the anchor fitting and parallel to the anchor fitting mounting surface.

From this position the upper attachment clip shall be capable of rotating to a minimum of 90° while remaining aligned with the longitudinal centre-line of the anchor fitting.

NOTE: Typical anchor fitting profiles that will interface with upper attachment clips are given in Figure 3.11.

3.5.2.4 *Upper attachment clip*

The following shall apply:

(a) The profile of the upper attachment clip shall fit wholly within the shaded areas shown in Figure 3.12.

(b) The upper attachment clip shall be designed so that it is capable of engaging the anchor fitting interface profile, with the main body of the upper attachment clip aligned with the longitudinal centre-line of the anchor fitting and parallel to the anchor fitting mounting surface.

From this position, the upper attachment clip shall be capable of rotating to a minimum of 90° while remaining aligned with the longitudinal centre-line of the anchor fitting.

(c) The upper attachment clip shall be retained by means of a retention device or devices.

(d) The retention device or devices of the upper attachment clip shall not extend beyond the broken lines shown in Figure 3.12(a) and (b).

(e) The retention device or devices of the upper attachment clip shall limit the movement of the upper attachment clip relative to a 6.4 mm diameter interface profile, to 12 mm maximum radius (see Figure 3.12(c)).

(f) The retention device or devices shall not move into the area shown in Figure 3.12(c) except when it is being depressed to allow engagement of the upper attachment clip to the anchor fitting.

(g) The upper attachment clip shall be capable of attachment to and removal from the largest anchor fitting interface profile shown in Figure 3.10.

3.5.2.5 *Interface between upper anchor fitting and upper attachment clip*

The interface between anchor fittings and upper attachment clips shall be as shown in Figure 3.10 and Figure 3.12.

Type E and F restraints that also require a child harness attachment point shall meet the requirements of both Figure 3.10 and Figure 3.11.

NOTE: See Note to Clause 3.2 on recommended weight and load limits for the child restraint.

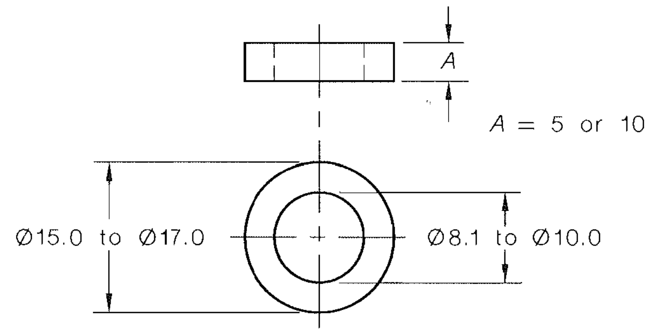


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FIGURE 3.8 SPACER

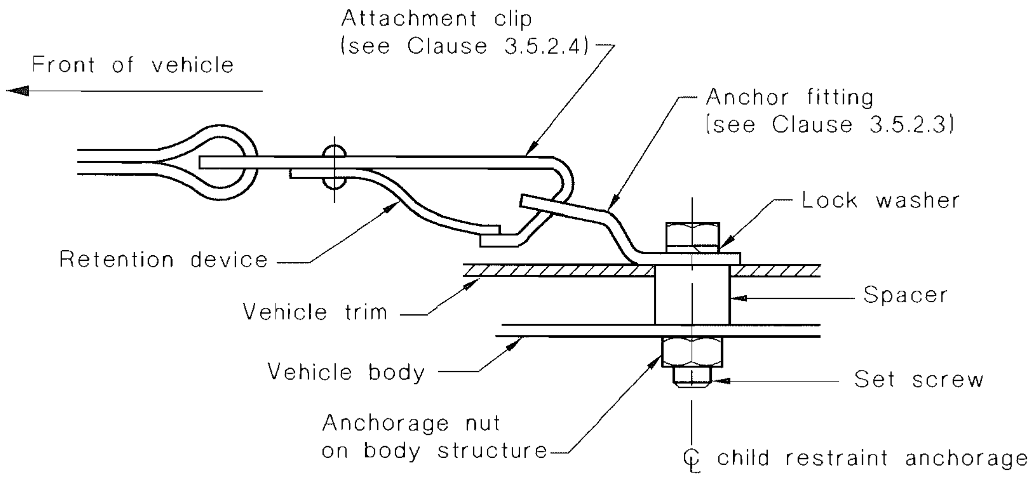
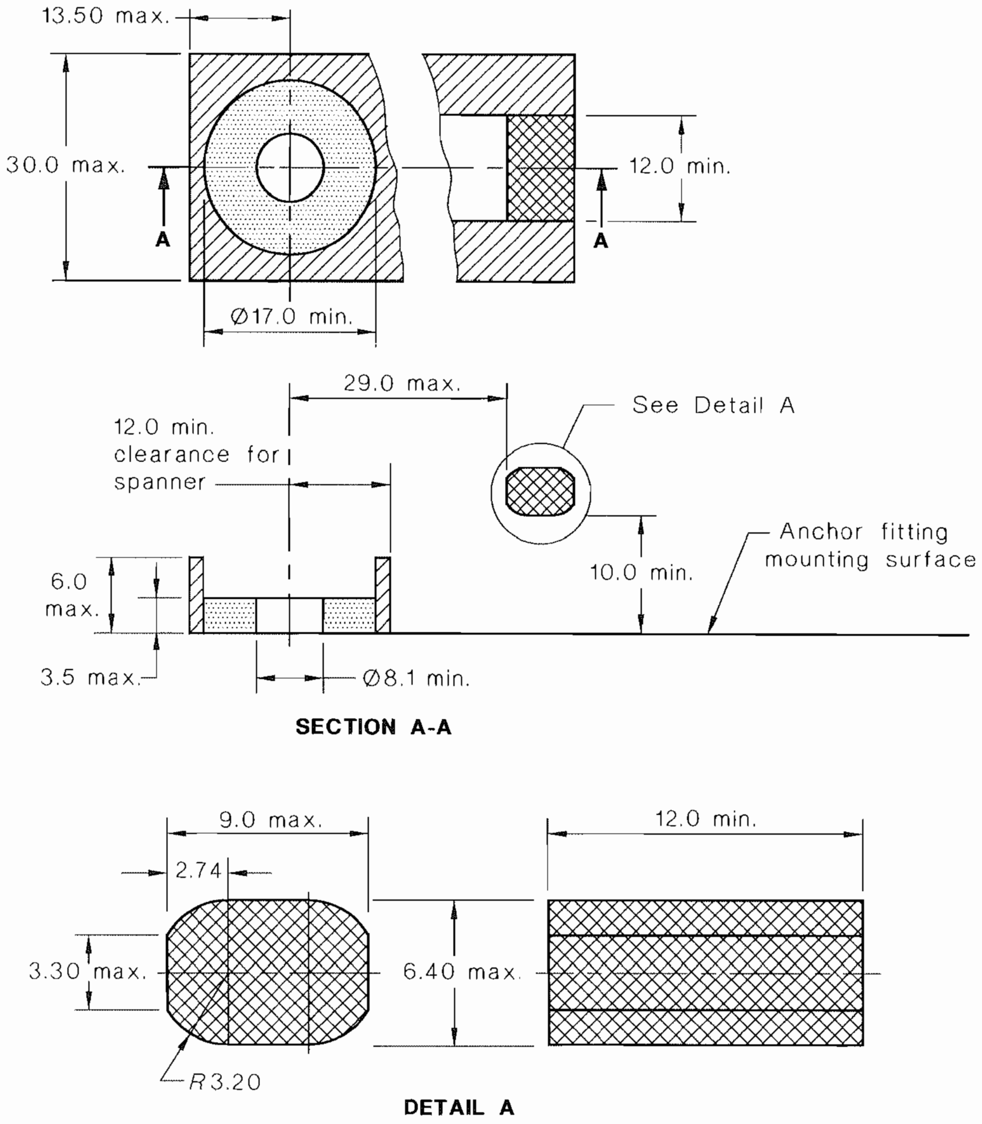

Front of vehicle
Attachment clip (see Clause 3.5.2.4)
Anchor fitting (see Clause 3.5.2.3)
Lock washer
Retention device
Spacer
Vehicle trim
Vehicle body
Set screw
Anchorage nut on body structure
℄ child restraint anchorage

FIGURE 3.9 TYPICAL CHILD RESTRAINT ANCHORAGE ASSEMBLY IN A VEHICLE WITH INBUILT CHILD RESTRAINT ANCHORAGES



LEGEND:

▨ Surrounding structure (if present)

▩ Area in which the child restraint anchor fitting interface profile must be wholly located

░ Area in which the mounting face must be wholly located

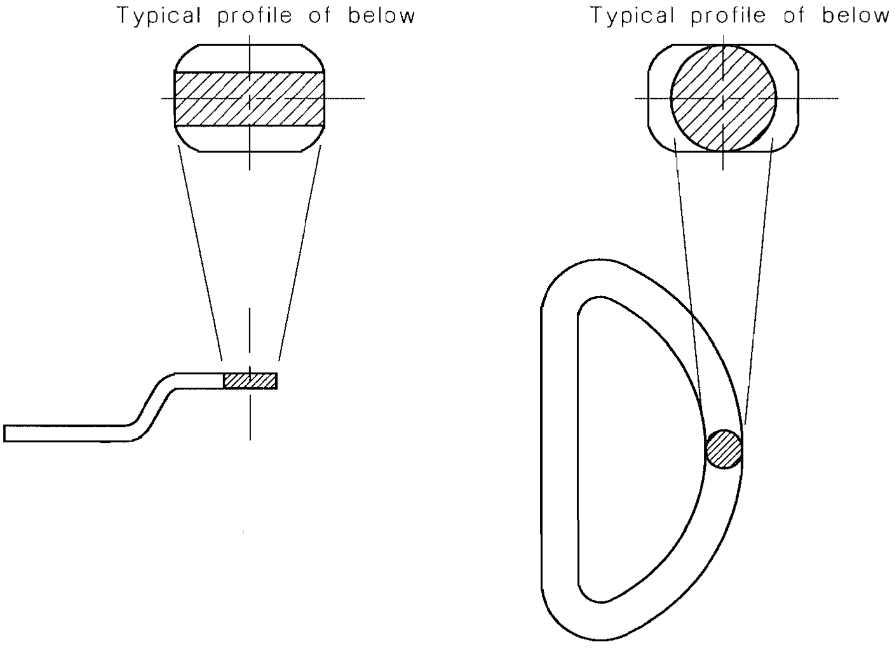
NOTES:

1 The interface profile may be round, oblong or a combination of both, providing it remains within the interface profile shown.

2 Detail A can rotate about its longitudinal centre.

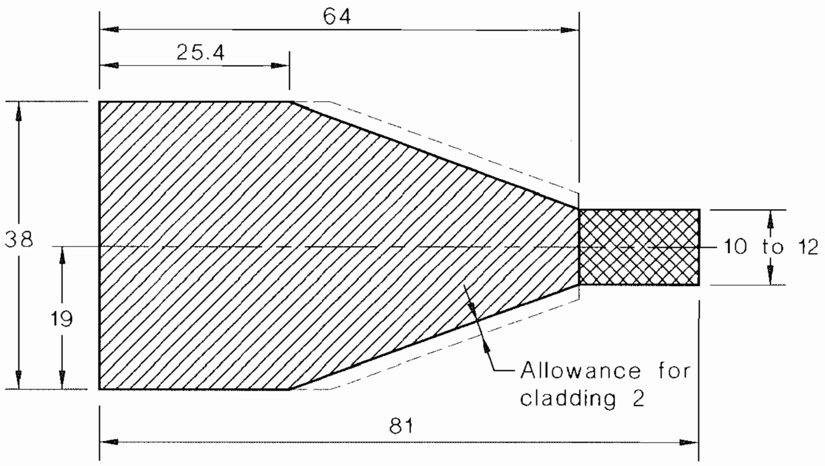
DIMENSIONS IN MILLIMETRES

FIGURE 3.10 INTERFACE PROFILE OF ANCHOR FITTING

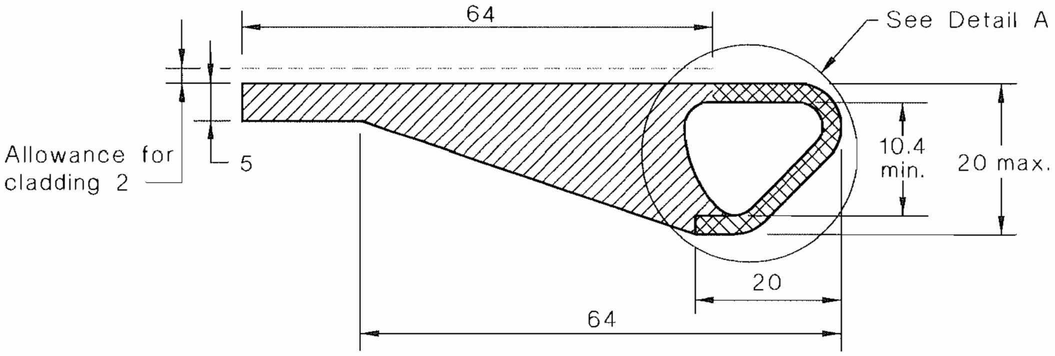


(a) Profile A fitting (b) Profile B fitting

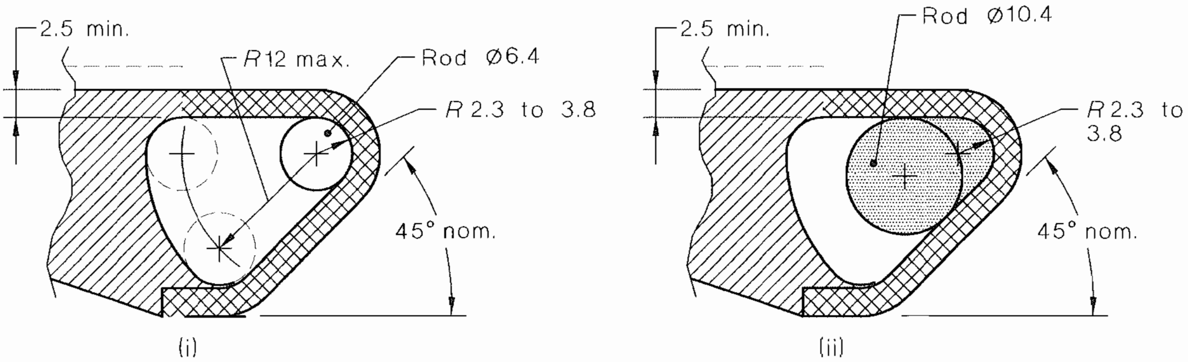
FIGURE 3.11 TYPICAL ANCHOR FITTING PROFILES THAT WILL INTERFACE WITH UPPER ATTACHMENT CLIPS



(a) Top view



(b) Side view



(c) Detail A

LEGEND:

░ Maximum unobstructed area in which the child restraint anchor fitting interface profile can move

▨ Surrounding structure (if present)

▩ Area in which the child restraint attachment clip interface profile must be wholly located

DIMENSIONS IN MILLIMETRES

FIGURE 3.12 INTERFACE PROFILE OF UPPER ATTACHMENT CLIP

3.6 RIGID COMPONENTS

Child restraints shall comply with the following:

(a) All rigid components including attachment devices, buckles, adjusters, anchorage components, bolts, screws and rivets, shall be designed or located so as not to cause harm to the child or damage to the child's clothing during use.

NOTE: Rigid components should also be designed so that they will not cause injury to any other occupants of the vehicle.

(b) The shell and lining of an enclosure or chair, and any rigid components of it, shall present a smooth surface to the wearer's body, especially the head and neck, both in the rest position and under stress in a crash. Particular attention shall be given to the possibility of rigid components punching through webbing, plastics, or padding.

(c) Hardware used for securing the ends of webbing shall have a smooth surface to the wearer's body, especially the head and neck, and the mass of any individual item of hardware located on the webbing shall not exceed 10 g.

NOTE: There are no restrictions on where the hardware is located on the strap.

(d) Stitching shall not normally be treated as a rigid component.

3.7 ACCESSORIES

3.7.1 General

The following shall apply:

(a) Accessories shall meet the relevant material, design and construction requirements of this Standard, and shall permit the child restraint to comply with this Standard.

(b) Accessories shall not include parts that may cause injury to the wearer or other occupants in a vehicle impact when used in the manner prescribed in the instructions.

NOTE: Examples of accessories that may cause injury are play trays, toy steering wheels and other items attached to the child restraint.

3.7.2 Removable liners and covers

NOTE: See Clause 3.2.1(k) for requirements for removable liners and covers.

3.8 ADJUSTERS

The following shall apply:

(a) A tilt-lock adjustment device shall lock at an angle of not less than 25° when tested in accordance with AS/NZS 4475.5.

(b) Slip adjusters, excluding extending energy absorbing devices, shall restrict slip at any load-carrying part to 25 mm and the total slip at all parts to 50 mm.

(c) The harness adjuster shall be tested in accordance with AS/NZS 3629.4 and the force required to overcome static friction or draw the webbing through the adjuster in either direction shall be not more than 50 N.

3.9 CORROSION PROTECTION OF METAL PARTS

Parts normally in contact with the wearer or other occupants shall not cause staining or discolouration of clothing.

3.10 DURABILITY OF COMPONENTS

Parts that slide, roll over, or engage in each other shall have sufficient resistance to wear.

NOTE: As a guide to durability, these parts should remain effective after 5000 operations.

3.11 WORKMANSHIP AND FINISH

3.11.1 General

All parts shall be finished smooth and free from rough edges, sharp corners, burrs and any irregularities that are potential hazards to the child wearing the restraint or occupants next to the restraint, or cause discomfort to the wearer or damage to clothing or vehicle trim.

3.11.2 Hazardous sharp edges and hazardous sharp points

The child restraint shall be examined for the accessibility of sharp points and sharp edges in accordance with AS/NZS ISO 8124.1. For examination purposes, the child restraint shall not be disassembled other than as permitted in the manufacturer's instructions. When tested, any accessible edge or point shall not be hazardous as defined in AS/NZS ISO 8124.1.

For the purpose of this Standard, where the word 'toy' appears in AS/NZS ISO 8124.1, the words 'child restraint component' shall be substituted.

3.11.3 Ingestion or inhalation hazards

Any component of the child restraint that is designed to be removed from the child restraint shall not present an ingestion or inhalation hazard when tested in accordance with AS/NZS ISO 8124.1.

3.11.4 Projections

Except for projections that are designed to be detachable, any projection that is able to be grasped with the thumb and forefinger or the teeth of a child shall be attached to the child restraint in a manner that prevents the component being removed or broken when it is tested in accordance with the torsion test and the tension test in AS/NZS ISO 8124.1.

3.12 CHILD RESTRAINTS DESIGNED FOR CHILDREN WITH DISABILITIES

Where child restraints are designed for children with disabilities requiring special needs, the child restraint shall comply with the intent of this Standard (see Clause 5.2.2(b) and Clause 6.3(h)).

SECTION 4 PERFORMANCE

4.1 GENERAL

When tested in accordance with Section 5, as applicable to each type of child restraint, the child restraint shall comply with the requirements of this Section.

4.2 HAZARDOUS THROAT CONTACT IN ABNORMAL SITUATIONS

When tested in accordance with AS/NZS 3629.2, Type B and Type D child restraints, which do not have a crotch strap or leg straps, shall show no evidence of throat contact having occurred.

4.3 DYNAMIC PERFORMANCE OF THE CHILD RESTRAINT

4.3.1 General requirements

The requirements in this clause apply to all child restraints. Additional requirements for particular types of child restraints are set out in Clauses 4.3.2 to 4.3.8.

When tested in accordance with AS/NZS 3629.1 and in accordance with Table 5.1 of this Standard, the child restraint system shall comply with the following:

(a) The child restraint system shall retain the dummy in the child restraint and shall retain the child restraint, including any additional parts, in the test rig.

(b) There shall be no evidence of complete separation of any load-carrying part or parts, and any part of the restraint that becomes detached from the restraint shall not weigh more than 20 g.

(c) In the frontal mode only, where there is a crotch strap, there shall be no contact of the strap with the genital region of the test dummy.

(d) The test dummy shall be able to be released by the operation of the quick-release device with a force of less than 110 N.

4.3.2 Type A1 child restraints

The following shall apply:

(a) When tested in the frontal mode using the TNO P¾ dummy, the resultant head deceleration of the test dummy shall not exceed 150*g* (see SAE J211, Channel Frequency Class 1000).

NOTE: The *g* forces should be substantially through the back of the torso.

(b) When tested in the rearward mode, the surface of any hardware designed to form part of the restraining harness surface in contact with the occupant in a crash shall remain in contact with the test dummy, while the harness is under load.

(c) When tested in the frontal and rearward modes, the test dummy's head shall remain within the area bounded by the sides AC and CD in Figure 4.1.

(d) When tested for side impact with the test door structure in accordance with Section 5 and AS/NZS 3629.1, the child restraint shall not allow the following:

  (i) The observable part of the dummy's head to be closer than 10 mm to the surface of the door structure when observed by a camera attached to the door structure.

(ii) Where a side wing on the child restraint has aperture/s then the head shall not contact the surface of the door structure through an aperture.

NOTE: It is not possible to measure the clearance where there is an aperture in the side structure.

(e) When tested in the frontal mode the dummy's head shall remain behind a vertical plane perpendicular to the direction of the trolley's travel and aligned with the foremost rigid point of the back or the headrest whichever is the most forward. The location of this point shall be defined with the cover and any padding removed from the region.

NOTE: To allow the foremost point to be observed during dynamic testing the cover and padding may be cut away in the immediate area to reveal potential points to be observed with an overhead camera. Care is required to maintain security of the cover and position of the cover so as to not affect the dummy's performance.

4.3.3 Type A2 child restraints

The following shall apply:

(a) When tested in the frontal mode using the TNO P1½ dummy, the resultant head deceleration of the test dummy shall not exceed 150*g* (see SAE J211, Channel Frequency Class 1000).

NOTE: The *g* forces should be substantially through the back of the torso.

(b) When tested in the rearward mode, the surface of any hardware designed to form part of the restraining harness surface in contact with the occupant in a crash shall remain in contact with the test dummy, while the harness is under load.

(c) When tested in the frontal and rearward modes, the test dummy's head shall remain within the area bounded by the sides AC and CD in Figure 4.1.

(d) When tested for side impact with the test door structure in accordance with Section 5 and AS/NZS 3629.1, the child restraint shall not allow the following:

(i) The observable part of the dummy's head to be closer than 10 mm to the surface of the door structure when observed by a camera attached to the door structure.

(ii) Where a side wing on the child restraint has aperture/s then the head shall not contact the surface of the door structure through an aperture.

NOTE: It is not possible to measure the clearance where there is an aperture in the side structure.

(e) When tested in the frontal mode the dummy's head shall remain behind a vertical plane perpendicular to the direction of the trolley's travel and aligned with the foremost rigid point of the back or the headrest whichever is the most forward. The location of this point shall be defined with the cover and any padding removed from the region.

NOTE: To allow the foremost point to be observed during dynamic testing the cover and padding may be cut away in the immediate area to reveal potential points to be observed with an overhead camera. Care is required to maintain security of the cover and position of the cover so as to not affect the dummy's performance.

4.3.4 Type A3 child restraints

The following shall apply:

(a) When tested in the frontal mode using the TNO P¾ dummy, the resultant head deceleration of the test dummy shall not exceed 150*g* (see SAE J211, Channel Frequency Class 1000).

(b) When tested in the frontal and rearward modes, the test dummy's head shall remain within the area bounded by the sides AB and BE in Figure 4.1.

(c) When tested for side impact with the test door structure in accordance with Section 5 and AS/NZS 3629.1, the child restraint shall not allow the following:

   (i) The observable part of the dummy's head to be closer than 10 mm to the surface of the door structure when observed by a camera attached to the door structure.

   (ii) Where a side wing on the child restraint has aperture/s then the head shall not contact the surface of the door structure through an aperture.

   NOTE: It is not possible to measure the clearance where there is an aperture in the side structure.

4.3.5 Type B child restraints

The following shall apply:

(a) The surface of any hardware designed to form part of the restraining harness surface in contact with the occupant, shall remain in contact with the test dummy while the harness is under load during frontal impact testing.

(b) Where there is a chest cross-strap, there shall be no throat contact by the chest cross-strap during frontal impact testing.

(c) When tested for side impact with the test door structure in accordance with Section 5 and AS/NZS 3629.1, the child restraint shall not allow the following:

   (i) The observable part of the dummy's head to be closer than 10 mm to the surface of the door structure when observed by a camera attached to the door structure.

   (ii) Where a side wing on the child restraint has aperture/s then the head shall not contact the surface of the door structure through an aperture.

   NOTE: It is not possible to measure the clearance where there is an aperture in the side structure.

(d) When tested in the rearward mode, the dummy's head shall not rotate rearwards more than 40° relative to a plane parallel to the back seating surface of the child restraint.

4.3.6 Type D child restraints

The following shall apply:

(a) When tested in the frontal mode, the resultant head deceleration of the test dummy shall not exceed 150*g* (see SAE J211, Channel Frequency Class 1000) when tested with a TNO P6 dummy.

   NOTE: The *g* forces should be substantially through the back of the torso.

(b) When tested in the rearward mode, the surface of any hardware designed to form part of the harness surface in contact with the occupant, shall remain in contact with the test dummy while the harness is under load.

(c) When tested in the frontal and rearward modes with a TNO P6 dummy, the test dummy's head shall remain within the area bounded by the sides AC and CD in Figure 4.1.

(d) When tested for side impact with the test door structure in accordance with Section 5 and AS/NZS 3629.1, the child restraint shall not allow the following:

(i) The observable part of the dummy's head to be closer than 10 mm to the surface of the door structure when observed by a camera attached to the door structure.

(ii) Where a side wing on the child restraint has aperture/s then the head shall not contact the surface of the door structure through an aperture.

NOTE: It is not possible to measure the clearance where there is an aperture in the side structure.

(e) When tested in the frontal mode with a TNO P3 dummy on a Spacer C as defined in Appendix B, the dummy's head shall remain behind a vertical plane perpendicular to the direction of the trolley's travel and aligned with the foremost rigid point of the back or the headrest whichever is the most forward. The location of this point shall be defined with the cover and any padding removed from the region.

NOTE: To allow the foremost point to be observed during dynamic testing the cover and padding may be cut away in the immediate area to reveal potential points to be observed with an overhead camera. Care is required to maintain security of the cover and position of the cover so as to not affect the dummy's performance.

4.3.7 Type E child restraints

The following shall apply:

(a) During testing, booster seats shall not become dislodged sufficiently to compromise the restraint seating position of the test dummy.

(b) When tested for side impact with the test door structure in accordance with Section 5 and AS/NZS 3629.1, the child restraint shall not allow the following:

(i) The observable part of the dummy's head to be closer than 10 mm to the surface of the door structure when observed by a camera attached to the door structure.

(ii) Where a side wing on the child restraint has aperture/s then the head shall not contact the surface of the door structure through an aperture.

NOTE: It is not possible to measure the clearance where there is an aperture in the side structure.

(c) In evaluating fragmentation of the booster seat made of foam, the restraints shall be assessed with the cover on. The mass of any fragment shall not exceed 20 g.

(d) During testing, the booster seat base shall not separate, either completely or partially from the remainder of the restraint. Partial separation is defined as more than 50% of total crack length of the perimeter joining the base to the remainder of the restraint with the cover removed.

(e) When tested in the rearward mode, the dummy’s head shall not rotate rearwards more than 40° relative to a plane parallel to the back seating surface of the child restraint.

(f) During frontal testing, if a sash guide is used to achieve Clause 3.2.8(j)(ii), the sash guide shall remain engaged with the seatbelt and the seat structure.

(g) Where testing is required with a child harness then testing shall be conducted for each model of harness nominated in the instruction book. If a booster seat is not permitted to use a child harness then no testing is required for the combination of booster seat and child harness.

4.3.8 Type F child restraints

The following shall apply:

(a) During testing, booster seats shall not become dislodged sufficiently to compromise the restraint seating position of the test dummy.

(b) When tested for side impact with the test door structure in accordance with Section 5 and AS/NZS 3629.1, the child restraint shall not allow the following:

  (i) The observable part of the dummy's head to be closer than 10 mm to the surface of the door structure when observed by a camera attached to the door structure.

  (ii) Where a side wing on the child restraint has aperture/s then the head shall not contact the surface of the door structure through an aperture.

  NOTE: It is not possible to measure the clearance where there is an aperture in the side structure.

(c) In evaluating fragmentation of the booster seat made of foam, the restraints shall be assessed with the cover on. The mass of any fragment shall not exceed 20 g.

(d) During testing, the booster seat base shall not separate, either completely or partially from the remainder of the restraint. Partial separation is defined as more than 50% of total crack length of the perimeter joining the base to the remainder of the restraint with the cover removed.

(e) During the forward motion of the dummy during frontal testing with the lap-sash belt, the sash belt shall not slip wholly off the shoulder region. The shoulder region is defined by the combination of the upper surfaces of the torso and upper arm segments.

(f) During the forward motion of the dummy during frontal testing, the lap belt shall not penetrate wholly into the flexible abdominal region of the dummy.

  NOTE: Compliance may be demonstrated by the lap belt not moving upwards more than 10 mm from its initial pre-impact position.

(g) During frontal testing, if a sash guide is used to achieve Clause 3.2.9.1(i)(ii), the sash guide shall remain engaged with the seatbelt and the seat structure.

(h) When tested in the rearward mode, the dummy’s head shall not rotate rearwards more than 40° relative to a plane parallel to the back seating surface of the child restraint.

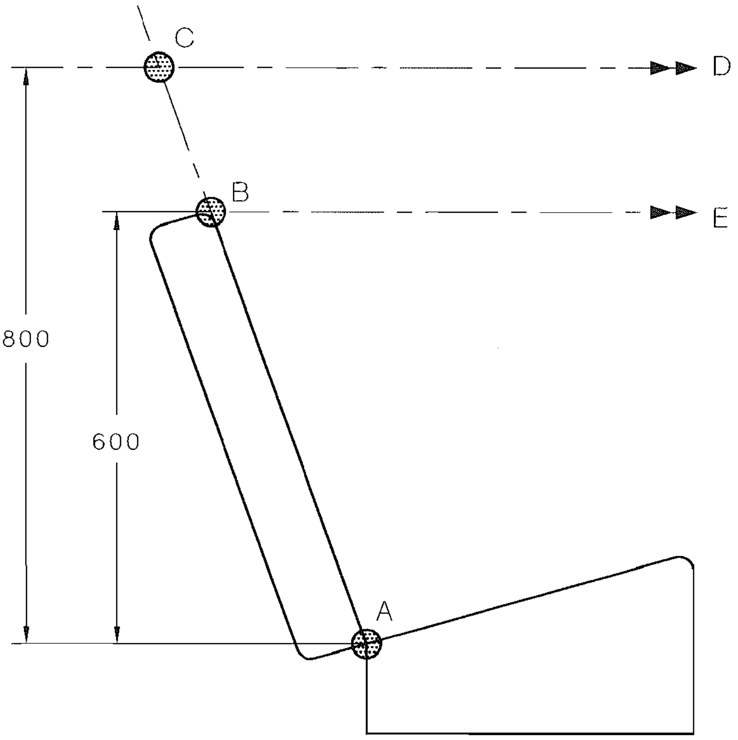
(i) Where testing is required with a child harness then testing shall be conducted for each model of harness nominated in the instruction book. If a booster seat is not permitted to use a child harness then no testing is required for the combination of booster seat and child harness.

4.4 DYNAMIC PERFORMANCE OF UPPER ANCHORAGE COMPONENTS

When upper anchorage components are tested in accordance with AS/NZS 3629.3, there shall be no evidence of complete separation of any load-carrying part or parts and no fragmentation of any rigid components.

4.5 DYNAMIC PERFORMANCE OF UPPER ANCHORAGE EXTENSION STRAPS

Any child restraint employing an upper tether strap shall demonstrate compliance with the dynamic performance requirements of this Standard when fitted with an extension tether strap.



DIMENSIONS IN MILLIMETRES

FIGURE 4.1 EXCURSION LIMITS

SECTION 5 TESTING

5.1 RECLINING CHILD RESTRAINTS

Reclining child restraints shall comply with the requirements of this Standard when tested at maximum and minimum limits for which they are designed to be reclined.

Level adjustment devices intended for providing a suitable backrest angle or base angle shall be adjusted in accordance with the manufacturer's instructions.

5.2 TEST DUMMIES

5.2.1 General

The following shall apply:

(a) Where a manufacturer specifies that the child restraint is a combination of types, testing shall be conducted for all of the specified types as required by Table 5.1.

NOTE: Recommended dummy types representative of age and nominal mass are detailed in Appendix D.

(b) Test dummies shall be clothed in summer-weight clothing as set out in Appendix A.

5.2.2 Test dummies for dynamic testing

The following shall apply:

(a) Test dummies shall be as specified in Table 5.1 for each type of child restraint and for each type of testing.

(b) Where a child restraint is specified as suitable for children with a specific disability, e.g. hip spica condition, testing shall be performed with the test dummy simulating the form of disability nominated on the child restraint.

5.2.3 Test dummies for determining the force required to operate adjusters in accordance with Clause 3.8(c)

The test dummies specified in AS/NZS 3629.4 shall be used.

5.3 CALIBRATION OF TNO TEST DUMMIES

TNO test dummies shall be calibrated in accordance with the TNO test dummy specification.

5.4 CHILD RESTRAINT TEST SPECIMEN

The following shall apply:

(a) If the upper anchorage strap is not of sufficient length to enable the child restraint to be attached to Point A2 shown in the dimensions for the test seat in AS/NZS 3629.1, an extension strap shall be provided.

(b) Where a seatbelt or child harness is stated to form part of a child restraint, a typical seatbelt or child harness shall be included with each such child restraint when it is submitted for testing.

(c) Where a loose cover forms part of a child restraint, the child restraint shall be tested with the cover on.

5.5 REMOVABLE ITEMS

When a child restraint is fitted with removable accessories in the seating region the testing required by Table 5.1 shall be conducted without those accessories. Additional testing may be required to ensure that the accessories do not lessen the performance required by this Standard. This additional testing shall be conducted for at least a frontal test with the largest test dummy for each type designation as required by Table 5.1.

Where an accessory such as a pillow or headrest device is removable or adjustable and has the potential for causing the head to be displaced forward when used, then, when testing sideways with door, the test shall be conducted with and without the accessory device in place.

NOTE: Accessories may be pillows, headrests, baby related inserts, comfort devices, play trays, converters, cup holders, arm rests and other items that are removable without the use of a tool.

TABLE 5.1

TEST SCHEDULE

Test specimens		Reference clause(s)	Feature tested and test method	Direction of testing for dynamic performance and test dummy/dummies to be used				
				Frontal	Sideways with door	Sideways without door	Rearwards	Inverted
Metal parts		2.2	Corrosion resistance, AS 2331.3.1	—	—	—	—	—
Fabric and chair material	All fabrics and padding materials	2.3.1	Flammability, AS 2755.2	—	—	—	—	—
	Fabrics with a pile or nap	2.3.1	Flammability, AS 2755.3	—	—	—	—	—
	Other chair materials	2.3.2	Flammability, SAE J369 or equivalent	—	—	—	—	—
Parts accessible to a child's mouth		2.4	Toxicity, AS/NZS ISO 8124.3	—	—	—	—	—
Chest cross-strap		3.2.1(i)	Tear-away capability	—	—	—	—	—
Complete seat with cover removed		3.2.1(o)	Rigid seat back height to Figure 3.1 and Table 3.1	—	—	—	—	—
Complete seat—Types A1, A2, A3, B and D		3.2.2(f) 3.2.3(g) 3.2.4(g) 3.2.5(f) 3.2.7(g)	Shoulder strap slot heights to Figure 3.1 and Table 3.1	—	—	—	—	—
Types A1, A2 and D child restraints		3.2.2(h) and 3.2.3(h)	Recline angle, AS/NZS 3629.6	—	—	—	—	—
Type B child restraint		3.2.5(g)	Recline angle	—	—	—	—	—
Complete Type B child restraint		3.2.5(k)	Spacing of leg straps	—	—	—	—	—

(continued)

TABLE 5.1 *(continued)*

Test specimens	Reference clause(s)	Feature tested and test method	Direction of testing for dynamic performance and test dummy/dummies to be used				
			Frontal	Sideways with door	Sideways without door	Rearwards	Inverted
Complete Type B child restraint	3.2.5(l)	Height of attachment of upper anchorage strap to child restraint	—	—	—	—	—
Complete Type E and Type F booster seats excluding upper anchorage components	3.2.8(d) 3.2.9(j)	Mass of booster seat	—	—	—	—	—
Complete Type E and Type F booster seats excluding upper anchorage components	3.2.8(l) 3.2.9(p)	Height of head support	—	—	—	—	—
Seating surface of booster seats	3.2.8(f) 3.2.9(k)	Compressibility	—	—	—	—	—
Complete Type E and Type F booster seats	3.2.8(i) 3.2.9(o)	Height of attachment of upper anchorage strap to child restraint	—	—	—	—	—
Complete Type E and Type F booster seats	3.2.8(j) 3.2.9(i)	Fit of the seatbelt to the dummy	—	—	—	—	—
Complete Type E and Type F booster seats	3.2.8(k) 3.2.9(e)	Depth of seating surface (leg angle) AS/NZS 3629.9	—	—	—	—	—
Complete Type E and Type F booster seats	3.2.8(m) 3.2.9(n)	Spacing of leg straps	—	—	—	—	—
Complete Type E and Type F booster seats when used with a child harness	3.2.8(n) 3.2.9(q)	Spacing of shoulder straps	—	—	—	—	—
Complete Type F booster seat	3.2.9(b)	Height measurement with TNO P10 dummy	—	—	—	—	—
Complete Type F booster seat	3.2.9(f)	Width profile, AS/NZS 3629.8	—	—	—	—	—

(continued)

TABLE 5.1 *(continued)*

Test specimens	Reference clause(s)	Feature tested and test method	Direction of testing for dynamic performance and test dummy/dummies to be used				
			Frontal	**Sideways with door**	**Sideways without door**	**Rearwards**	**Inverted**
Complete Type F booster seat	3.2.9(h)	Lateral support measurements	—	—	—	—	—
Quick-release device	3.4.1(f)(iv)	Actuation force and fatigue effect, AS/NZS 3629.5	—	—	—	—	—
	3.4.1(f)(vii)	Inadvertent release potential	—	—	—	—	—
Complete child restraints, except Type C	3.5.1(e)	Seatbelt length, AS/NZS 3629.7	—	—	—	—	—
Tilt-lock adjustment devices	3.8(a)	Locking angle, AS/NZS 4475.5	—	—	—	—	—
Adjuster	3.8(c)	Adjustment device force, AS/NZS 3629.4	—	—	—	—	—
Complete child restraint	3.11.2, 3.11.3 and 3.11.4	Sharp edges and sharp points, ingestion or inhalation hazards and projections, AS/NZS ISO 8124.1	—	—	—	—	—
Complete Type B and Type D child restraints	4.2	Hazardous throat contact, AS/NZS 3629.2	—	—	—	—	—
Complete Type A1 and Type A3 child restraints	4.3	Dynamic performance, AS/NZS 3629.1	TARU Theresa*, TNO P¾†, TNO P¾ with removable items, and TNO P¾ plus extension strap	TNO P¾	TARU Theresa	TARU Theresa and TNO P¾	TARU Theresa

(continued)

TABLE 5.1 *(continued)*

Test specimens	Reference clause(s)	Feature tested and test method	Direction of testing for dynamic performance and test dummy/dummies to be used				
			Frontal	Sideways with door	Sideways without door	Rearwards	Inverted
Complete Type A2 child restraints			TARU Theresa*, TNO P1½‡, TNO P1½ with removable items, and TNO P1½ plus extension strap§	TNO P1½	TARU Theresa	TARU Theresa and TNO P1½	TARU Theresa
Complete Type B child restraints			TNO P¾, TNO P6, TNO P6 with removable items, and TNO P6 plus extension strap§	TNO P¾ TNO P3 with Spacer C as defined in AS/NZS 1754 Appendix B	TNO P¾	TNO P3 with Spacer C as defined in AS/NZS 1754 Appendix B	—
Complete Type C child restraints and Type F Converters	4.3	Dynamic performance, AS/NZS 3629.1	TNO P3, TNO P10 Weighted to 36 kg, and TNO P10 weighted to 36 kg with removable items	—	TNO P3	—	—
Complete Type D child restraints			TNO P¾, TNO P6, TNO P3 with Spacer C as defined in Appendix B, TNO P6 with removable items and TNO P6 plus extension strap	TNO P¾ TNO P3 with Spacer C as defined in AS/NZS 1754 Appendix B	TNO P¾	TNO P6, TNO P3 with Spacer C as defined in AS/NZS 1754 Appendix B	—
Complete Type E Booster seats	4.3	Dynamic performance, AS/NZS 3629.1	TNO P3, TNO P10, TNO P6 with removable items, if applicable TNO P6 with a Type C child restraint. If applicable, TNO P10 plus extension strap§	TNO P3 TNO P6 with Spacer C as defined in AS/NZS 1754 Appendix B	TNO P3	TNO P6 with Spacer C as defined in AS/NZS 1754 Appendix B)	—

(continued)

TABLE 5.1 *(continued)*

Test specimens	Reference clause(s)	Feature tested and test method	Direction of testing for dynamic performance and test dummy/dummies to be used				
			Frontal	**Sideways with door**	**Sideways without door**	**Rearwards**	**Inverted**
Complete Type F Booster seats	4.3	Dynamic performance, AS/NZS 3629.1	TNO P3, TNO P10 weighted to 36 kg, TNO P10 weighted to 36 kg with removable items, if applicable TNO P10 weighted to 36 kg with Type C If applicable TNO P10 weighted to 36 kg with extension strap[‖]	TNO P3 and TNO P10	TNO P3	P10 weighted to 36 kg	
Label	6.2.5 and 6.2.6	Durability of marking and adhesion of label	—	—	—	—	—
Upper anchorage components	4.4	Dynamic performance, AS/NZS 3629.3	—	—	—	—	—

* TARU Theresa test dummy.

† TNO dummies as specified in technical drawings produced by the FTSS Europe, PO Box 6045, 2600 JA Delft, Netherlands.

‡ TNO P1½ dummies shall have additional mass added to achieve 12 kg. This may be achieved by the addition of head or 'chest' transducers or substitute or equivalents.

§ With reference to Clause 5.4(a).

‖ TNO P10 dummy weighted to 36 kg. Additional 3 kg is to be added to the TNO P10 to increase the nominal mass to 36 kg. 1 kg to be placed in the back pelvic cavity. 1 kg placed in each of the back chest cavities. Foam and tape can be added to ensure there is no movement of the masses.

SECTION 6 INFORMATIVE LABELLING, INSTRUCTIONS, MARKING AND PACKAGING

6.1 GENERAL LABELLING REQUIREMENTS

6.1.1 Scope of section

This Section specifies general requirements for the packaging and labelling of child restraints and specific requirements for categories of information to be supplied with each child restraint.

The categories are—

(a) information to be supplied on the packaging;

(b) information to be supplied in an instruction book or sheet;

(c) for Type A1, Type A2 and Type D child restraints, information to be supplied on a swing ticket or label; and

(d) information to be permanently marked on the child restraint.

NOTE: Manufacturers making a statement of compliance with this Standard on a product or on packaging or promotional material related to that product are advised to ensure that such compliance is capable of being verified.

6.1.2 Language

The instructions shall be printed in English.

6.1.3 Print size

Printing shall be clear and legible and shall be in either initial capital and lower-case letters or all capital letters, except for the warnings in Table 6.2, which shall be in the same case as shown in the Table. Unless otherwise specified the capital letters shall have a height of not less than 1.8 mm.

NOTE: Examples of suitable typeface for printing instructions are Helvetica and Univers.

6.1.4 Illustrations

The instructions shall be illustrated, where appropriate, and the instruction book or sheet shall include diagrams showing the correct methods of attachment of the child restraint and the correct method of use.

6.1.5 Durability of marking

The wording on labels fixed to the product and on fabric covers shall be easily legible when rubbed by hand for 15 s with a piece of cloth soaked in water, allowed to dry and rubbed for 15 s with a piece of cloth soaked with liquid domestic dishwashing detergent.

Where a fabric or flexible label is used for the marking requirements of Clauses 6.7 and 6.8 on a removable liner or cover, the marking shall remain easily legible when the fabric component is washed 6 times according to the care label. Where care instructions are not provided, then 6 gentle machine wash cycles shall be performed. Label edges shall not curl or roll-up such that the marking becomes obscured. Labels shall remain fully attached and there shall be no signs of fraying. The wording on the labels shall be easily legible after washing.

6.1.6 Adhesion of labels

6.1.6.1 *Adhesive labels fixed to materials other than foam*

The force required to peel an adhesive type label over a distance of 10 mm or before the label begins tearing, shall be not less than 10 N/25 mm width when the label is subjected to the following procedure:

Condition and test three specimens at 23 ±5°C and 50 ±10% relative humidity. Labels shall be attached for a minimum of 48 h in the manner as used by the child restraint manufacturer. For each label, peel back a length of not less than 15 mm to enable gripping of the label. Mark at any starting point. Attach a force measuring machine with an accuracy of ±2 N by clamping the label without creating a stress point on the label. Apply a steadily increasing force at a rate of not less than 75 mm/m while pulling the label at an angle of 180° so that the label is doubled back and in alignment with itself, until peeling commences or tearing occurs. Measure the force over 10 mm or until tearing occurs.

6.1.6.2 *Adhesive labels fixed to foam*

The force required to peel an adhesive type label over a distance of 10 mm or before the label begins tearing, shall be not less than 5 N/25 mm width when the label is subjected to the procedure in Clause 6.1.6.1.

6.1.7 Use of product name

The manufacturer may substitute the product name, for example 'this . . . (name of product)' for the words 'this restraint' in labelling, including the warning statements in Table 6.2.

6.1.8 Standard warning format

6.1.8.1 *General*

Unless otherwise specified, the use of the '**WARNING**' heading shall comply with this Clause (6.1.8).

Use of the word '**WARNING**' and the associated triangle symbol in areas not specified by this Standard is permitted but any such usage shall comply with the requirements of this Clause.

6.1.8.2 *Labels (see Figure 6.1)*

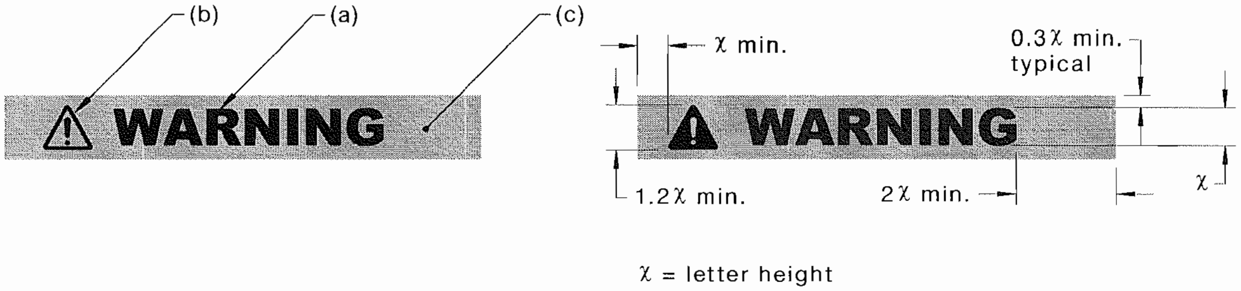
Labels shall use the following format:

(a) The word '**WARNING**':
  (i) Font: Upper case Helvetica Bold or similar.
  (ii) Colour: Black.
  (iii) Minimum height: 5.0 mm.

(b) Triangle symbol:
  (i) Colour: Black outline and exclamation mark, or solid black triangle with the exclamation mark reversed out in the background colour.
  (ii) Minimum height: 6.0 mm.
  (iii) Placement: Left hand side of '**WARNING**'.

(c) Background colour: Orange (e.g. PMS or Pantone 137) or Yellow (e.g. Pantone Yellow C).

(d) Size of '**WARNING**' heading shall be in accordance with the dimensional relationship contained in Figure 6.1.



NOTE: (a), (b) and (c) refer to the corresponding Items in Clause 6.1.8.2.

FIGURE 6.1 STANDARD FORMAT FOR WARNING LABELS

6.1.8.3 *Instructions, packaging and swing tickets (see Figure 6.2)*

The instructions packaging and swing tickets shall have the following:

(a) Background colour: Orange (e.g. PMS or Pantone 137), yellow (e.g. Pantone Yellow C) or white. If white is used '**WARNING**' and the triangle symbol shall be contained in a black or red border.

(b) The word '**WARNING**'—

  (i) Font: Bold upper case Helvetica or similar.

  (ii) Colour:

    (A) If yellow or orange background is used, black text is appropriate.

    (B) If white background is used, red or black text is appropriate.

  (iii) Minimum height: 2.5 mm.

(c) Triangle symbol—

  (i) Colour:

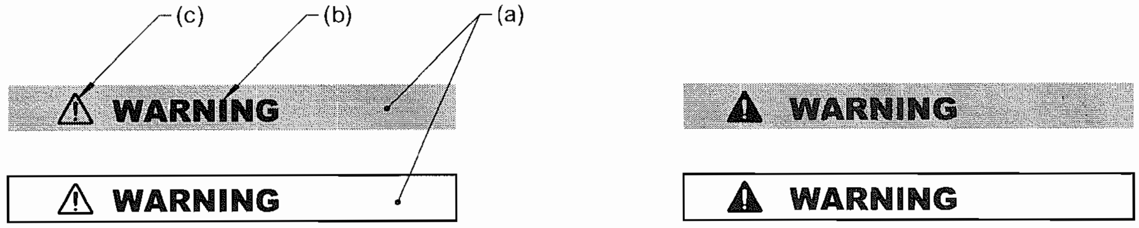
    (A) If yellow or orange background is used, black outline and exclamation mark, or solid black triangle with the exclamation mark reversed out in the background colour.

    (B) If white background is used, black or red outline and exclamation mark, or solid black triangle with the exclamation mark reversed out in the background colour.

  (ii) Minimum height: 4.5 mm.

  (iii) Placement: Left hand side of '**WARNING**'.

(d) Size of '**WARNING**' heading shall be in accordance with the dimensional relationship contained in Figure 6.1.



NOTE: (a), (b) and (c) refer to the corresponding Items in Clause 6.1.8.3.

FIGURE 6.2 STANDARD FORMAT FOR WARNING LABELS FOR INSTRUCTIONS

6.2 GENERAL PACKAGING REQUIREMENTS

6.2.1 Product protection

The child restraint shall be packaged as follows:

(a) The child restraint shall be packaged in such a manner that it will be protected against damage during normal handling, transport and storage.

(b) The child restraint assembly shall be contained in one package.

(c) Where the child restraint has an integral harness, the child restraint shall be presented in the package with the shoulder straps threaded in the lowest strap slot or position.

Flexible plastic packaging shall meet the requirements specified in Clause 6.2.3.

6.2.2 Consumer protection

Packages that are intended to be opened by the consumer shall be constructed as to minimize the hazards from fasteners during the unpacking process.

6.2.3 Flexible plastic packaging

6.2.3.1 *Large packaging*

Where the flexible plastics packaging is in the form of a bag or in the form of wrapping that, when removed from the package, is capable of being formed into a bag that has, or is capable of having, an opening with a circumference of 350 mm or more, and a depth of 130 mm or more, both dimensions being measured after the packaging has been stretched to its fullest extent, then the packaging shall either—

(a) be perforated with round holes of at least 5 mm diameter, or other shaped holes of equivalent area, so that when the whole of square test, measuring 150 mm along each side, is placed any where on the packaging, the template will completely cover at least one hole; or

(b) be made from a plastics material that has a thickness of 38 μm or more and carry a legible cautionary label similar to the following:

WARNING

TO AVOID DANGER OF SUFFOCATION TO BABIES AND CHILDREN DISPOSE OF THIS BAG IMMEDIATELY

Tie into knots or shred plastics before storing for recycling or disposing in rubbish bin. Do not burn plastics

NOTES:

1 The purpose of this Clause is to ensure either of the following:

   (a) There are sufficient number of holes in the flexible plastics packaging to prevent the possibility of suffocation if the child places the packaging over its head.

   (b) The suffocation hazard is highlighted by way of a warning notice if the packaging does not have a sufficient number of holes. A minimum thickness is also required to reduce the tendency of the plastics to conform to the child's face and so obviate a suffocation hazard. (See the Note in Clause 6.2.3.2.)

2 Since the wording on the cautionary label is only an example, it is permissible to use other words, e.g. '**CAUTION**' in place of '**WARNING**'.

6.2.3.2 *Small packaging*

Where flexible plastic packaging is in the form of a bag or in the form of wrapping that, when removed from the package, is capable of being formed into a bag that has, or is capable of having, an opening with circumference of less than 350 mm and/or a depth of less than 130 mm, both dimensions being measured after the packaging has been stretched to its fullest extent, then it is recommended that the packaging be made from a plastics material that has a thickness of 19 μm or more.

NOTE: A minimum thickness of 19 μm is recommended because the thinner the plastics, the greater is its tendency to conform to contours, such as a child's face. Further, thin plastics often have a static charge that causes the plastics to adhere to skin. Accordingly the combination may present a suffocation danger even though the packaging may be relatively small.

6.3 INFORMATION TO BE SUPPLIED ON PACKAGING

The following information shall be on the packaging:

(a) Manufacturer's registered brand name.

(b) Model designation.

(c) The appropriate statement from Table 6.1.

TABLE 6.1

STATEMENTS ON PACKAGING SPECIFYING THE SUITABILITY OF THE CHILD RESTRAINT FOR CHILDREN

Type of child restraint or combinations of types	Statement
Type A1	To be used only in a rearward-facing position until the infant's shoulders reach the shoulder height marker (approximately 6 months of age).
Type A2	To be used only in a rearward-facing position until the infant's shoulders reach the shoulder height marker (approximately 12 months of age).
Type A3	To be used only lying across the seat in a transverse position until the infant's shoulders reach the shoulder height marker (approximately 6 months of age).
Type B	To be used only in forward-facing position by children whose shoulders are above the lower shoulder height marker (approximately 6 months of age) until the shoulders reach the upper shoulder height marker (approximately 4 years of age).
Type A1 and Type B	To be used only in a rearward-facing position until the infant's shoulders reach the lower shoulder height marker (approximately 6 months of age). Then to be used in forward-facing position until the shoulders reach the upper shoulder height marker (approximately 4 years of age).
Type A2 and Type B	To be used only in a rearward-facing position until the child's shoulders reach the lower shoulder height marker (approximately 12 months of age). Then to be used in forward-facing position until the shoulders reach the upper shoulder height marker (approximately 4 years of age).
Type C	To be used only in a forward-facing position. For children aged approximately 4 to 7 years of age, the restraint should be used with a compatible booster seat and seatbelt. For children aged approximately 8 to 10 years of age, the restraint should be used either with a compatible booster seat and seatbelt, or on a vehicle seat with a lap only seatbelt. It is not recommended that this restraint be used on a vehicle seat with a lap-sash seatbelt.

(continued)

TABLE 6.1 (*continued*)

Type of child restraint or combinations of types	Statement
Type D	To be used in rear-facing position by children whose shoulders are above the lower shoulder height marker (approximately 6 months of age) until the shoulders reach the upper shoulder height marker (approximately 4 years of age.
Type E	To be used with either a lap-sash seatbelt or an add-on accessory child harness by children whose shoulders are above the lower shoulder height marker (approximately 4 years of age) until child's shoulders reach the upper shoulder height marker (approximately 6 to 8 years of age).
Type F converters	To be used by a child able to sit in the car's seat and use an adult lap-sash seatbelt, typically 8 to 10 years of age.
Type F	To be used with either a lap-sash seatbelt or an add-on accessory child harness by children whose shoulders are above the lower shoulder height marker (approximately 4 years of age) until child's shoulders reach the upper shoulder height marker (approximately 8 to 10 years of age).
Type E with adjustable head restraint	To be used with either a lap-sash seatbelt or an add-on accessory child harness by children whose shoulders are above the lower shoulder height marker with head restraint in lowest position (approximately 4 years of age) until child's shoulders reach the upper shoulder height marker with head restraint in highest position (approximately 6 to 8 years of age).
Type F with adjustable head restraint	To be used with either a lap-sash seatbelt or an add-on accessory child harness by children whose shoulders are above the lower shoulder height marker with head restraint in lowest position (approximately 4 years of age) until child's shoulders reach the upper shoulder height marker with head restraint in highest position (approximately 8 to 10 years of age).
Type B and Type E	To be used in forward-facing position with built-in harness by children whose shoulders are above the lower shoulder height marker (approximately 6 months of age) until the shoulders reach the middle shoulder height marker (approximately 4 years of age). Then to be used with either a lap-sash seatbelt or an add-on accessory child harness until child's shoulders reach the upper shoulder height marker (approximately 6 to 8 years of age)
Type B and Type F	To be used in forward-facing position with built-in harness by children whose shoulders are above the lower shoulder height marker (approximately 6 months of age) until the shoulders reach the middle shoulder height marker (approximately 4 years of age). Then to be used with either a lap-sash seatbelt or an add-on accessory child harness until child's shoulders reach the upper shoulder height marker (approximately 8 to 10 years of age).

NOTE: For Type E and F booster seats that are not suitable for use with a Type C child harness, or an add-on accessory child harness, the child harness advice can be omitted.

(d) With the exception of Type E and Type F booster seats, the following statement specifying the intended use of the child restraint:

TO BE USED WITH A LAP-SASH/LAP-ONLY* SEATBELT IN THE FRONT/BACK* OF MOST CARS WITH FORWARD FACING SEATS

If applicable, advice shall be given that an extension strap or straps may be needed for vehicles without a fixed parcel shelf and where to obtain extension straps. This should include extension strap part numbers.

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* Manufacturer to use appropriate term.

(e) With the exception of Type E and Type F child restraints with a mass of 2 kg or less, the following statement:

THIS RESTRAINT MUST BE ATTACHED TO A CHILD RESTRAINT ANCHORAGE POINT IN THE CAR. REFER TO CAR OWNER'S HANDBOOK FOR LOCATION OF ANCHORAGE POINTS. REFER TO A CHILD RESTRAINT FITTING STATION IF NO ANCHORAGE POINTS ARE IN THE MOTOR CAR.

(f) For Type A1, Type A2 and Type D child restraints—

  (i) the as-installed dimensions of the child restraint; and

  (ii) a note to the purchaser that the purchaser should check the measurements between the front of the seat back of the rear seat and all front seats in the car in which the child restraint is intended to be used, to ensure that the space is sufficient.

(g) For Type E and Type F booster seats, the following statement as appropriate:

  (i) If the restraint is suitable for use with a Type C child harness:

  THIS RESTRAINT MUST BE USED IN CARS WITH FORWARD-FACING SEATS WITH A LAP-SASH SEATBELT OR WITH A SEATBELT AND CHILD HARNESS.

  (ii) If the restraint is not suitable for use with a Type C child harness:

  THIS RESTRAINT MUST BE USED IN CARS WITH FORWARD-FACING SEATS WITH A LAP-SASH SEATBELT. THIS BOOSTER SEAT IS NOT SUITABLE FOR USE WITH A CHILD HARNESS.

(h) If the child restraint is designed for a child with a disability, the occupant's disability and any limitations on the use of the child restraint.

(i) All restraints with a top tether shall contain the following warning:

THIS RESTRAINT IS NOT SUITABLE FOR USE WHERE THE ANCHORAGE STRAP MAY FALL INTO A SPLIT IN THE SEAT BACK (E.G. HATCHBACK OR WAGON).

(j) For Type E or Type F booster seats that are suitable for use with a Type C harness, the booster seat may include the following statement:

THIS BOOSTER SEAT MAY ONLY BE SUITABLE FOR USE WITH A CHILD HARNESS IN THE UPRIGHT POSITION. IN THE RECLINE POSITION, THE CAR'S SEATBELT MAY NOT BE LONG ENOUGH.

(k) For Type E or Type F booster seats, the models of Type C child harnesses that are suitable for use with the booster seat shall be specified.

6.4 INFORMATION TO BE SUPPLIED IN AN INSTRUCTION BOOKLET OR SHEET

6.4.1 General information

For each child restraint, general information, and information and instructions for installation, use and maintenance shall be provided in a booklet or sheet, which shall be attached to the child restraint by any means that will allow its removal, or provided in a pocket, or for Type C restraints, shall be in the package with the child restraint.

Information supplied shall include the information in Clause 6.3.

If a pocket is provided, the cover of the booklet or sheet should state the following:

IMPORTANT: KEEP THIS BOOKLET/SHEET* IN THE PLACE PROVIDED ON THE CHILD RESTRAINT.

NOTE: Provision for the instruction book to remain permanently with the child restraint is a desirable design feature.

6.4.2 Instructions for installation

Instructions for installation shall include the following:

(a) A statement advising the installer to read carefully the whole of the instructions for installation and, in the event of doubt about the method of installation, to consult the child restraint manufacturer or agent, or a child restraint fitting station authorized by the relevant transport authority, or in New Zealand, to consult the agent for the vehicle.

(b) Except for Type E and Type F child restraints with a mass of 2 kg or less, instructions for the fitting of the upper anchor fitting in the vehicle as shown in Appendix C, including all illustrations of the direction of installation of the upper anchor fitting in relation to the front of the vehicle.

6.4.3 Instructions for use

Instructions for use shall include the following:

(a) Information in Clauses 6.6 (h), (i), (k), (l), (m), (p) and (r);

(b) The appropriate statement in accordance with Table 6.3.

(c) The general and appropriate additional warnings in accordance with Table 6.2.

(d) For Type A1 and Type A2 child restraints, the required position of the child to achieve the necessary distribution of deceleration forces.

(e) For all Type A child restraints, an appropriate statement that care and attention be given to ventilation and shading of the occupant.

(f) Illustrated instructions for the correct adjustment of shoulder straps.

(g) A statement that seatbelt extenders should not be used if the seatbelt is not long enough to secure the child restraint.

(h) Advice for babies as follows:

  (i) For Types A1 and A2 child restraints, advise that if the baby's neck muscles are unable to support their head, then the child should remain rear facing.

  (ii) For Type B child restraints, advise that the child should not sit forward facing until the baby's neck muscles are able to support their head.

(i) With the exception of Type C and Type F converters, provide information by way of illustration and text about the shoulder height labels, to advise that the child restraint is not suitable for the child when the child's shoulders are above or below the shoulder height markers, or that the child restraint is required to be turned around, as appropriate to the child restraint.

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* Manufacturer to use appropriate term.

(j) Advice on the next type of child restraint that the occupant will require as they grow and reach the shoulder height markers. Also provide illustrations of typical child restraints and approximate ages as included in Table 6.1 that are suitable for children to progress to after using the child restraint covered in the instruction book and as follows:

  (i) Type A1, A2 and A3 child restraints shall have illustrations of Type B as a minimum. If Type D is not on the market then it may be ignored.

  (ii) Type B child restraints shall have illustrations of Type E and/or Type F booster seat as a minimum.

  (iii) Type E child restraints shall have illustrations of Type F booster seat as a minimum.

  (iv) Type F child restraints shall have illustrations of the correct use of a lap-sash seatbelt.

(k) The shoulder height marker labels required to be placed on the child restraint in Clause 6.7 shall be shown at not less than 75% of the full size in the instruction booklet. In addition, an explanation of the use and the purpose of the limits required by the shoulder height markers shall be provided.

NOTE: Example of statement to explain the shoulder height labels:

> For Type B—
>
> 'The child restraint is unsuitable for the occupant when the shoulders are below the lower marker or above the upper marker. The child needs to be moved into the next form of child restraint (booster seat) when they reach the top shoulder height marker'.

(l) With the exception of Type C and Type F Converters, the child restraint instructions shall include the following statement in bold lettering of at least 2.5 mm for capital letters, surrounded by a border with a line width of at least 2 mm.

VERY IMPORTANT: Only use this child restraint with the cover supplied or a manufacturer-authorized replacement cover with identical shoulder height markers.

(m) For Type E and F booster seats, the child restraint instructions shall include the following warning in bold lettering of at least 2.5 mm for capital letters, surrounded by a border with a line width of at least 2 mm.

WARNING: A sash belt under the arm or behind the back is dangerous.

(n) Illustrations or photos showing the seatbelt shall highlight the belt in the colour required for identifying the seatbelt path as specified in Clause 6.6.

NOTE: The colour may be outlined for contrast.

(o) For Type E or Type F booster seats, the models of Type C child harnesses that are suitable for use with the booster seat shall be specified.

NOTE: For Type E and F booster seats that are not suitable for use with a Type C child harness, or an add-on accessory child harness, the child harness advice can be omitted.

(p) Where a child restraint that can be adjusted or installed so that child restraint may reduce its level of safety then specific statement shall be made advising caution and referring to sections of the instructions advising the correct use.

NOTE: Advice such as not installing the child restraint excessively reclined for convertible child restraints; not adjusting harness or tether strap hardware such that it sits too close to the occupant; using the wrong seatbelt path; installing in the incorrect direction for Type A restraints.

(q) For child harnesses with a locking device to convert the lap and sash belts in to a lap only configuration or to stop the seatbelt loosening, advice shall be provided that the device must be removed when the child restraint is not installed to allow other users to use the seatbelt as a lap-sash seatbelt.

6.4.4 Instructions for maintenance

Instructions for maintenance shall include recommended procedures for cleaning and inspection of the buckle or for its replacement.

6.5 INFORMATION TO BE SUPPLIED ON A SWING TICKET OR LABEL

For Type A1 and Type A2 and Type D child restraints, the following information shall be provided either on a swing ticket or on a label attached to the child restraint in such a manner that it can be viewed by the prospective purchaser of the child restraint:

CHECK THAT THIS CHILD RESTRAINT WILL FIT IN YOUR CAR.

6.6 MARKING

Each child restraint shall be permanently and legibly marked with the following:

(a) Manufacturer's name, trademark, or other means of identification.

NOTE: A distributor's identification is not adequate for this purpose unless it also clearly identifies the manufacturer.

(b) Model designation.

(c) Month and year of manufacture of the assembly, e.g. 1/2010.

(d) References as to the edition of this Standard, i.e. 2010.

(e) The appropriate statement from Table 6.4.

(f) The general and appropriate additional warnings given in Table 6.2.

(g) On anchorage straps, the warning for anchorage straps in accordance with Table 6.2.

(h) The following warning shall be marked on the seat cover or the front of the seat such that the marking can be seen from the front and side of the child restraint without being obscured by the occupant:

WARNING: DO NOT LEAVE CHILDREN UNATTENDED IN THE CAR

The word '**WARNING**' and the associated triangle symbol shall comply with the format in Clause 6.1.8.2, and Figure 6.1 with a letter height of at least 5 mm and the remaining text shall be a minimum of 2.5 mm high bold upper case, in black on a white background. The label shall have a black border with a minimum thickness of 2 mm.

Where the label is sewn to the seat cover then it shall meet the requirements of Clause 6.8.

The visibility of the label shall be evaluated by fitting the child restraint on the dynamic test seat as described in AS/NZS 3629.1 in accordance with the manufacturer's instructions. The largest applicable test dummy is then seated in the child restraint and the securing system fitted without any spacers. The label or marking of the above warning shall be visible when the child restraint is viewed at an angle of 45° and a distance of 1.5 m from the Point A of Figure 4.1. The label or marking shall also be visible when viewed in the 45° plane intersecting Point A when viewed at 45° at a distance of a least 1 m either side of the centre-line of the child restraint.

(i) For Type A, Type B, Type D and Type E with slots for Type C and Type F with slots for Type C child restraints—

  (i) instructions for the correct tensioning of the harness; and

  (ii) illustrated instructions for the correct use of shoulder straps.

  The information shall include either of the following, as appropriate:

  (A) For Type A1, Type A2, Type E with slots for Type C and Type F with slots for Type C—

  'The shoulder straps must be in the slots which are nearest to the child's shoulders, but not lower than the child's shoulders'.

  (B) For Type B and Type D child restraints—

  'The shoulder straps must be in the slots which are nearest to the child's shoulders, but not more than 25 mm below the child's shoulders'.

(j) Statements required by Clauses 6.3(d) or 6.3(g) as applicable.

(k) For Type E and Type F restraints that utilize a sash guide to achieve the provisions of Clause 3.2.8(j)(ii) or Clause 3.2.9.1(i)(ii) a statement advising that the sash guide must be used at all times 'ALWAYS USE THIS SASH GUIDE'. This information shall be marked on the sash guide assembly or near the region of the sash guide.

(l) For Type E and Type F restraints that utilize a device between the legs that attaches to the lap belt as defined in Clauses 3.2.8(m) or Clause 3.2.9.1(n) a statement advising that this device must be used at all times 'ALWAYS USE THIS DEVICE*'. This information shall be marked on the device or near the region of the device.

(m) Excluding Type C and Type F converters, the seatbelt path and any restraint features that position the seatbelt shall be defined by indicators in a colour indicated as follows:

  (i) Type A1, A2, A3 and D shall be blue and shall state—'REARWARD-FACING BELT PATH'.

  (ii) Type B shall be yellow and shall state—'FORWARD-FACING BELT PATH'.

  (iii) Type E and F shall be red and shall state—'BOOSTER SEATBELT PATH'.

  NOTE: Colours should be primary or close to primary colours.

  Each side of a lap belt path shall have a seatbelt path indicator. The sash belt path shall also be identified where it exits the child restraint structure, if not centrally located then on both sides of the structure. If a sash belt is required to be deflected through more than one deflection then each deflection point shall be labelled.

  The area of colour on each seatbelt indicator path shall be least 900 mm^2. In the case of double-sided labels or components, the area shall be determined without including the area of the back. The text shall be a contrasting colour to the background. The text size shall be at least 2.5 mm in height.

  Parts or fabric near the seatbelt path marking shall not be coloured red, blue or yellow as this may confuse the indication of the seatbelt path. Where confusion is possible then the indicator shall have a black or white border of at least 4 mm.

  NOTE: For the purposes of this Clause, an indicator may be a coloured label with the copy included on it, or a component of the child restraint correctly coloured and appropriately labelled.

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* Manufacturers may substitute other description rather than 'device'.

(n) The child restraint shall be marked with shoulder height indication as specified in Clause 6.7, Table 6.5 and Figure 6.3. The text size shall be at least 2.5 mm in height.

(o) For Type A, Type B and Type D restraints, the following statement shall be marked near the harness or the adjuster or adjuster label 'A LOOSE HARNESS IS DANGEROUS '. The text size shall be at least 2.5 mm in height.

(p) For Type E and Type F booster seats the following statement shall be marked on the seat cover and visible from the front or side of the seat when installed: 'A SASH BELT UNDER THE ARM OR BEHIND THE BACK IS DANGEROUS'. The visibility of the label shall be evaluated as described in Clause 6.6(h). The text size shall be at least 2.5 mm in height.

(q) Where a harness adjustment or other user adjustments are required to be made when the child restraint is installed and the actuator is not visible from the front or side of the seat then a marking with appropriate advice shall be attached to the seat or fabric cover in close proximity to the location of the actuator.

(r) When illustrations or photos are used to show the seatbelt, the illustrated belt shall be highlighted in the colour required for identifying the belt path as specified in Clause 6.6(m).

NOTE: The colour may be outlined for contrast.

(s) The main cover shall be marked with the same information as required by Clause 6.4.3(l). The marking may be on the inside of the cover provided it is easily seen when the cover is removed.

6.7 SHOULDER HEIGHT MARKING

Shoulder height markings and labels shall meet the following requirements:

(a) The marking shall be permanently fixed to a structure of the seat or on the fabric cover.

(b) The marking shall be positioned in close proximity to the expected occupant shoulder height or close to the shoulder strap slots and located as specified in Table 6.6, and as follows:

  (i) The label shall be near the shoulder strap slot or seatbelt guide. It may be on the backrest of the seat or the side of the seat.

  NOTE: Labels should be positioned at the side of the seating surface, perpendicular to the backrest or headrest of the restraint. Where there is no structure at the side then the label should be positioned on the backrest. Labels should not be positioned on surfaces facing away from the child. This does not preclude having longer labels but the information in Figure 6.3 should be in accordance with this Clause.

  (ii) If the label is on the side of the seat then it shall be substantially on the surface that is the seating area adjacent to the occupant.

  (iii) For Type A, the label shall be within 25mm above or below the top harness slot and not less than 125 mm below the top of the back of the restraint.

  (iv) For Type B, the label shall be not more than 25 mm above the top harness slot and not less than 135 mm below the top of the back of the restraint. Where a label position coincides with the slot position specified in Clause 3.2, Figure 3.1, and Table 3.1 then the bottom edge of the label may be placed up to 10 mm above or below the slot as appropriate.

NOTE: As fabric covers can vary in positioning on the seat structure, it is accepted that the labels may be up to 20 mm out of position from that specified. This concession does not apply to child restraints submitted for type testing for certification purposes.

(c) The labels shall be permanently fixed to fabric covers—

   (i) any sewing shall be completely around the perimeter of the label;

   (ii) any other attachment method shall be around the perimeter of the label if not across the whole back of the label; and

   (iii) loop or tab labels are not acceptable.

(d) The labels shall be as nominated in Table 6.5.

(e) The size of the label text box on the label shall be as defined in Figure 6.3. The labels may have rounded corners with a radius up to 4 mm.

(f) The colour of the text on the labels shall be black.

(g) The background colour of the label shall be white or a light colour that allows the printing to provide good contrast. Colours used for the seatbelt path or warning heading background shall not be used for a background although lighter shades are acceptable.

(h) Labels shall not be covered by the seat structure, fabric cover or accessories.

NOTE: For a rationale of shoulder height marking, see Appendix E.

6.8 MARKING ON FABRIC COVERS

Marking on child restraints may be applied on the fabric cover where the following requirements are met:

(a) Flat labels shall be permanently fixed to fabric covers—

   (i) any sewing shall be completely around the perimeter of the label; or

   (ii) any other attachment method shall be around the perimeter of the label if not across the whole back of the label.

(b) Loop or tab labels shall meet the following requirements:

   (i) Be fully sewn along one side.

   (ii) Not create a loop where the aperture is such that it accepts a 25 mm cylinder with a spherical end when applied with a force not exceeding 20 N.

   (iii) Withstand a tearing force of 40 N applied by gripping one free corner of the label adjacent to the attached side of the label and applying a force parallel to the attached side towards the opposite end of the label. The label shall not tear more than 5 mm.

   (iv) After durability testing of Clause 6.1.5 the labels shall be legible.

   (v) If only printed on one side then the printed side shall face away from the fabric or seat structure.

(c) Fabric labels greater than 10 000 mm^2 in area shall be subjected to the flammability requirements of Clause 2.3. Labels with an area smaller than this need not be tested as part of any flammability requirement of Clause 2.3.1. For loop labels, the area shall be taken as the unfolded area.

NOTE: These requirements are intended to allow essential information to be visible to the user even after long-term use of the device.

TABLE 6.2

WARNINGS FOR THE USE OF CHILD RESTRAINTS

General warnings (for all child restraints)	Additional warnings					Warning for upper anchorage strap and extension straps
	Type A child restraints	Type B child restraints	Type C child restraints	Type D child restraints	Type E booster seats and Type F booster seats and Type F converters*	
Use the restraint exactly as shown in the instructions. Supervision of children is needed because they may be able to undo buckles. DO NOT LEAVE CHILDREN UNATTENDED IN THE CAR. Do not alter or modify this restraint. Repairs must only be done by the manufacturer or agent. Do not allow the restraint to come into contact with polishes, oils, bleach and other chemicals. Destroy the restraint if it has been in a severe crash, even if no damage is visible.	To ensure baby's back is evenly supported, do not put more than one nappy on the baby and make sure the nappy is not thickly folded at the back. DO NOT USE A REAR-FACING CHILD RESTRAINT WHERE AN AIRBAG IS FITTED IN FRONT OF THE SEATING POSITION. Fit the restraint firmly to the car seat. Fit the harness firmly to the child. A loose restraint or harness is dangerous.	Fit the restraint firmly to the car seat. Fit the harness firmly to the child. A loose restraint or harness is dangerous.	The lap belt must be adjusted firmly first, and then the harness, so that the belt is not lifted off the child's lap when the harness is adjusted. DO NOT USE THIS HARNESS IF THE CHILD'S SHOULDERS ARE ABOVE THE TOP OF THE CAR SEAT BACK OR HEADREST.	DO NOT USE A REAR-FACING CHILD RESTRAINT WHERE AN AIRBAG IS FITTED IN FRONT OF THE SEATING POSITION. Fit the restraint firmly to the car seat. Fit the harness firmly to the child. A loose restraint or harness is dangerous.	DO NOT USE WITH JUST A LAP BELT. You must use with a lap-sash seatbelt, or with a seatbelt and child harness. The lap part of the seatbelt must be firmly across the thighs and the sash straps fitted diagonally across the chest and on the shoulder. If used with a child harness, the lap strap of the seatbelt must be adjusted firmly first, and then the harness, so that the lap-strap is not lifted off the child's lap when the harness is adjusted. DO NOT USE THIS RESTRAINT WITHOUT THE COVER.	WARNING: Straps may be damaged by unsecured cargo in a collision. Secure or remove hazardous cargo before using this strap. Hatch-back or wagon: Do not use the child restraint where this strap may fall into a split in the seat back. Always attach hook and remove slack.

* For Type F converters use warnings that are applicable to the device.

TABLE 6.3

STATEMENTS FOR INSTRUCTION BOOKLETS SPECIFYING THE SUITABILITY OF THE CHILD RESTRAINT TO GROUPS OF CHILDREN

Type of child restraint or combinations of types	Statement
Type A1	To be used only in a rearward-facing position for an infant until their shoulders reach the shoulder height marker (approximately 6 months of age). Continue to use this infant restraint until the child reaches this limit. Infants are at risk of serious injury if they face forward too early.
Type A2	To be used only in a rearward-facing position for an infant until their shoulders reach the shoulder height marker (approximately 12 months of age). Continue to use this infant restraint until the child reaches this limit. Infants are at risk of serious injury if they face forward too early.
Type A3	To be used only lying across the seat in a transverse position for an infant until their shoulders reach the shoulder height marker (approximately 6 months of age). Continue to use this infant restraint until the child reaches this limit. Infants are at risk of serious injury if they face forward too early.
Type B	To be used in forward-facing position by children whose shoulders are above the lower shoulder height marker (approximately 6 months of age) until their shoulders reach the upper shoulder height marker (approximately 4 years of age). Continue to use this child restraint until the child reaches this limit. Do not use this restraint until child's shoulders are above the lower shoulder height marker. Infants are at risk of serious injury if they face forward too early. Children are at risk of serious injury if they move to booster seats too early. Children that have outgrown this restraint are safest in a booster seat until their shoulders reach the upper shoulder height marker of the booster seat.
Type A1 and Type B	To be used only in a rearward-facing position for an infant until their shoulders reach the lower shoulder height marker (approximately 6 months of age). Then to be used in forward-facing position until their shoulders reach the upper shoulder height marker (approximately 4 years of age). Continue to use this child restraint until the child reaches this limit. Do not use forward facing until child's shoulders are above the lower shoulder height marker. Infants are at risk of serious injury if they face forward too early. Children are at risk of serious injury if they move to booster seats too early. Children that have outgrown this restraint are safest in a booster seat until their shoulders reach the upper shoulder height marker of the booster seat.
Type A2 and Type B	To be used only in a rearward-facing position for an infant until their shoulders reach the lower shoulder height marker (approximately 12 months of age). Then to be used in forward-facing position until their shoulders reach the upper shoulder height marker (approximately 4 years of age). Continue to use this child restraint until the child reaches this limit. Do not use forward facing until child's shoulders are above the lower shoulder height marker. Infants are at risk of serious injury if they face forward too early. Children are at risk of serious injury if they move to booster seats too early. Children that have outgrown this restraint are safest in a booster seat until their shoulders reach the upper shoulder height marker of the booster seat.
Type C	Child harnesses should be used in conjunction with a compatible booster seat by children aged at least 4 whose shoulders are above the lower shoulder height marker, to at least 7 and as either a stand-alone restraint or with a compatible booster by children at least 8 to approximately 10 years. Children should continue to use a booster until their shoulders reach the upper shoulder height marker. Do not use this restraint until child's shoulders are above the lower shoulder height marker on the booster seat. Children are safest in a booster.
Type D	To be used in a rearward-facing position by children whose shoulders are above the lower shoulder height marker (approximately 6 months of age) until their shoulders reach the upper shoulder height marker (approximately 4 years of age). Continue to use this child restraint until the child reaches this limit. Do not use this restraint until child's shoulders are above the lower shoulder height marker.

(continued)

TABLE 6.3 *(continued)*

Type of child restraint or combinations of types	Statement
Type E	To be used with either a lap-sash seatbelt or an add-on accessory child harness by children whose shoulders are above the lower shoulder height marker (approximately 4 years of age) until child's shoulders reach the upper shoulder height marker (approximately 6 to 8 years of age). Continue to use this child restraint until the child reaches this limit. Children are safest in a booster seat until their shoulders reach the upper shoulder height marker of the booster seat. Do not use this restraint until child's shoulders are above the lower shoulder height marker. Just using a seatbelt is not recommended for children that have outgrown this seat. Use a larger booster seat.
Type F converter	Only to be used by children able to sit in the car's seat and use an adult seatbelt, typically 8 to 10 years of age.
Type F	To be used with either a lap-sash seatbelt or an add-on accessory child harness by children whose shoulders are above the lower shoulder height marker (approximately 4 years of age) until their shoulders reach the upper shoulder height marker (approximately 8 to 10 years of age). Continue to use this booster seat until the child reaches this limit. Children are safest in a booster seat until their shoulders reach the upper shoulder height marker of the booster seat. Do not use this restraint until child's shoulders are above the lower shoulder height marker.
Type E with adjustable head restraint	To be used with either a lap-sash seatbelt or an add-on accessory child harness by children whose shoulders are above the lower shoulder height marker with head restraint in lowest position (approximately 4 years of age) until their shoulders reach the upper shoulder height marker with head restraint in highest position (approximately 6 to 8 years of age). Continue to use this child restraint until the child reaches this limit. Children are safest in a booster seat until their shoulders reach the upper shoulder height marker of the booster seat. Do not use this restraint until child's shoulders are above the lower shoulder height marker with the head restraint in the lowest position. Just using a seatbelt is not recommended for children that have outgrown this seat. Use a larger booster seat.
Type F with adjustable head restraint	To be used with either a lap-sash seatbelt or an add-on accessory child harness by children whose shoulders are above the lower shoulder height marker with head restraint in lowest position (approximately 4 years of age) until their shoulders reach the upper shoulder height marker with head restraint in highest position (approximately 8 to10 years of age). Continue to use this booster seat until the child reaches this limit. Children are safest in a booster seat until their shoulders reach the upper shoulder height marker of the booster seat. Do not use this booster seat until child's shoulders are above the lower shoulder height marker with the head restraint in the lowest position.
Type B and Type E	To be used in forward-facing position with built-in harness by children whose shoulders are above the lower shoulder height marker (approximately 6 months of age) until their shoulders reach the middle shoulder height marker (approximately 4 years of age). Then to be used with either a lap-sash seatbelt or an add-on accessory child harness until their shoulders reach the upper shoulder height marker (approximately 6 to 8 years of age). Continue to use this child restraint until the child reaches this limit. Children are safest in a booster seat until their shoulders reach the upper shoulder height marker of the booster seat. Do not use this restraint until child's shoulders are above the lower shoulder height marker. Just using a seatbelt is not recommended for children that have outgrown this seat. Use a larger booster seat.
Type B and Type F	To be used in forward-facing position with built-in harness by children whose shoulders are above the lower shoulder height marker (approximately 6 months of age) until their shoulders reach the middle shoulder height marker (approximately 4 years of age). Then to be used with either a lap-sash seatbelt or an add-on accessory child harness until their shoulders reach the upper shoulder height marker (approximately 8 to 10 years of age). Continue to use this child restraint until the child reaches this limit. Children are safest in a booster seat until their shoulders reach the upper shoulder height marker of the booster seat. Do not use this restraint until child's shoulders are above the lower shoulder height marker.

NOTE: For Type E and F booster seats that are not suitable for use with a Type C child harness, or an add-on accessory child harness, the child harness advice can be omitted.

TABLE 6.4

STATEMENTS TO BE MARKED ON THE CHILD RESTRAINT SPECIFYING THE SUITABILITY OF THE CHILD RESTRAINT FOR GROUPS OF CHILDREN

Type of child restraint or combinations of types	Statement
Type A1	To be used only in a rearward-facing position for an infant until their shoulders reach the shoulder height marker (approximately 6 months of age).
Type A2	To be used only in a rearward-facing position for an infant until their shoulders reach the shoulder height marker (approximately 12 months of age).
Type A3	To be used only lying across the seat in a transverse position for an infant until their shoulders reach the shoulder height marker (approximately 6 months of age).
Type B	To be used in forward-facing position by children whose shoulders are above the lower shoulder height marker (approximately 6 months of age) until their shoulders reach the upper shoulder height marker (approximately 4 years of age).
Type A1 and Type B	To be used only in a rearward-facing position for an infant until their shoulders reach the lower shoulder height marker (approximately 6 months of age). Then to be used in forward-facing position until the shoulders reach the upper shoulder height marker (approximately 4 years of age).
Type A2 and Type B	To be used only in a rearward-facing position for an infant until their shoulders reach the lower shoulder height marker (approximately 12 months of age). Then to be used in forward-facing position until the shoulders reach their upper shoulder height marker (approximately 4 years of age).
Type C	To be used only in a forward-facing position. For children aged approximately 4 to 7 years of age, the restraint should be used with a compatible booster seat and seatbelt. For children aged approximately 8 to 10 years of age, the restraint should be used either with a compatible booster seat and seatbelt, or on a vehicle seat with a lap only seatbelt. It is not recommended that this restraint be used on a vehicle seat with a lap-sash seatbelt.
Type D	To be used in a rearward-facing position by children whose shoulders are above the lower shoulder height marker (approximately 6 months of age) until their shoulders reach the upper shoulder height marker (approximately 4 years of age).
Type E	To be used with either a lap-sash seatbelt or an add-on accessory child harness by children whose shoulders are above the lower shoulder height marker (approximately 4 years of age) until their shoulders reach the upper shoulder height marker (approximately 6 to 8 years of age).
Type F converters	Only to be used by children able to sit in the car's seat and use an adult seatbelt, typically 8 to 10 years of age.
Type F	To be used with either a lap-sash seatbelt or an add-on accessory child harness by children whose shoulders are above the lower shoulder height marker (approximately 4 years of age) until their shoulders reach the upper shoulder height marker (approximately 8 to 10 years of age).
Type E with adjustable head restraint	To be used with either a lap-sash seatbelt or an add-on accessory child harness by children whose shoulders are above the lower shoulder height marker with head restraint in lowest position (approximately 4 years of age) until tbeir shoulders reach the upper shoulder height marker with head restraint in highest position (approximately 6 to 8 years of age).
Type F with adjustable head restraint	To be used with either a lap-sash seatbelt or an add-on accessory child harness by children whose shoulders are above the lower shoulder height marker with head restraint in lowest position (approximately 4 years of age) until their shoulders reach the upper shoulder height marker with head restraint in highest position (approximately 8 to 10 years of age).
Type B and Type E	To be used in forward-facing position with built-in harness by children whose shoulders are above the lower shoulder height marker (approximately 6 months of age) until their shoulders reach the middle shoulder height marker (approximately 4 years of age). Then to be used with either a lap-sash seatbelt or an add-on accessory child harness until their shoulders reach the upper shoulder height marker (approximately 6 to 8 years of age).

(continued)

TABLE 6.4 (*continued*)

Type of child restraint or combinations of types	Statement
Type B and Type F	To be used in forward-facing position with built-in harness by children whose shoulders are above the lower shoulder height marker (approximately 6 months of age) until their shoulders reach the middle shoulder height marker (approximately 4 years of age). Then to be used with either a lap-sash seatbelt or an add-on accessory child harness until their shoulders reach the upper shoulder height marker (approximately 8 to 10 years of age).

NOTE: For Type E and F booster seats that are not suitable for use with a Type C child harness, or an add-on accessory child harness, the child harness advice can be omitted.

TABLE 6.5

SHOULDER HEIGHT MARKER LABELS TO BE USED ON EACH CHILD RESTRAINT

Type of child restraint or combinations of types	Label number as shown in Figure 6.3		
	Lower shoulder height label	Middle/transition shoulder height label	Upper shoulder height label
Type A1	N/A	N/A	Label 1
Type A2	N/A	N/A	Label 1
Type A3	N/A	N/A	Label 1
Type B	Label 2	N/A	Label 1
Type A1 and Type B	N/A	Label 3	Label 1
Type A2 and Type B	N/A	Label 3	Label 1
Type C	N/A	N/A	N/A
Type D	Label 2	N/A	Label 1
Type E	Label 2	N/A	Label 1
Type F Converter	N/A	N/A	N/A
Type F	Label 2	N/A	Label 1
Type E with adjustable head restraint	Label 5	N/A	Label 4
Type F with adjustable head restraint	Label 5	N/A	Label 4
Type B and Type E	Label 2	Label 6	Label 1
Type B and Type F	Label 2	Label 6	Label 1

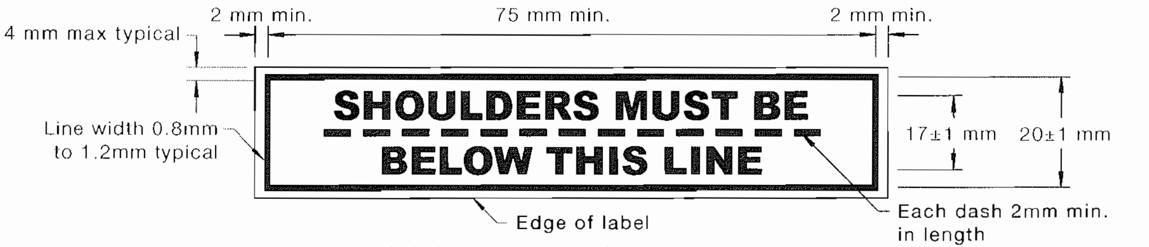
TABLE 6.6

LOCATION OF THE SHOULDER HEIGHT MARKER LABELS

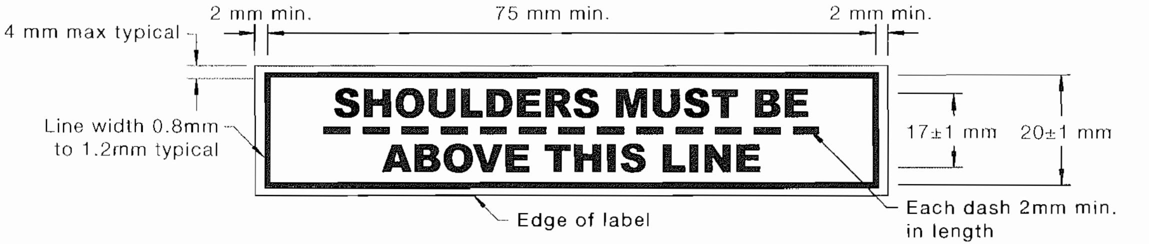
Type of child restraint or combinations of types	Minimum height of the lower shoulder height marker label * mm	Minimum height of the middle/transition shoulder height marker label* mm	Minimum height/distance of the upper shoulder height marker label mm
Type A1	N/A	N/A	290*
Type A2	N/A	N/A	310*
Type A3	N/A	N/A	290*
Type B	290*	N/A	385*
Type A1/B	N/A	290*	385*
Type A2/B	N/A	310*	385*
Type C	N/A	N/A	N/A
Type D	290*	N/A	385*
Type E	360*	N/A	145†
Type F converter	N/A	N/A	N/A
Type F	360*	N/A	155†
Type E with adjustable head restraint	360*	N/A	145†
Type F with adjustable head restraint	360*	N/A	155†
Type B/E	290*	385*	145†
Type B/F	290*	385*	155†

* Height measured from the seating surface to the centre-line of the label in relation to a plane 100 mm from the seat back as used for shoulder slot heights in Figure 3.1 with a 9 kg weighted bag of nominal dimensions 200 mm × 150 mm placed on the seating surface.

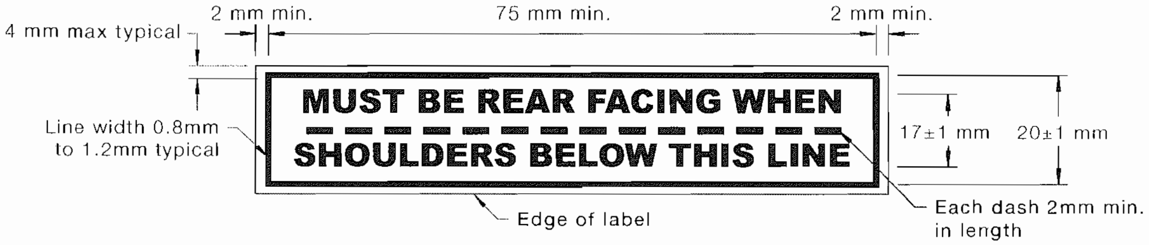
† Distance from the top of the seat back as measured along the surface of the seat back.



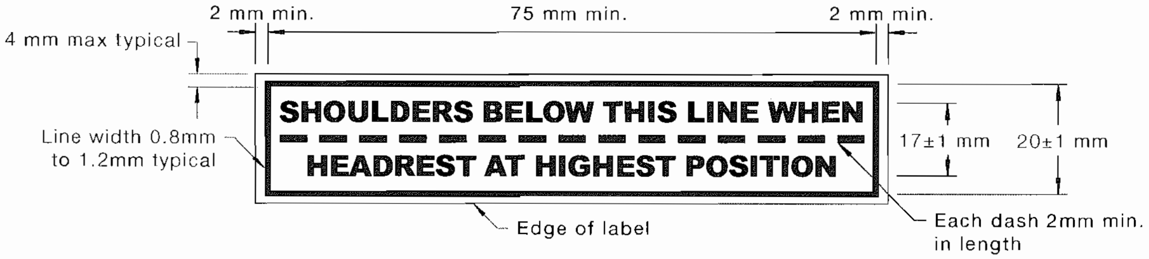
(i) Label 1, maximum height marker



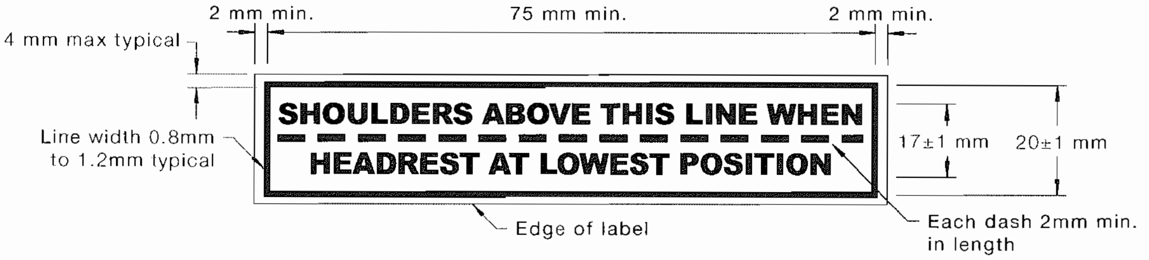
(ii) Label 2, minimum height marker



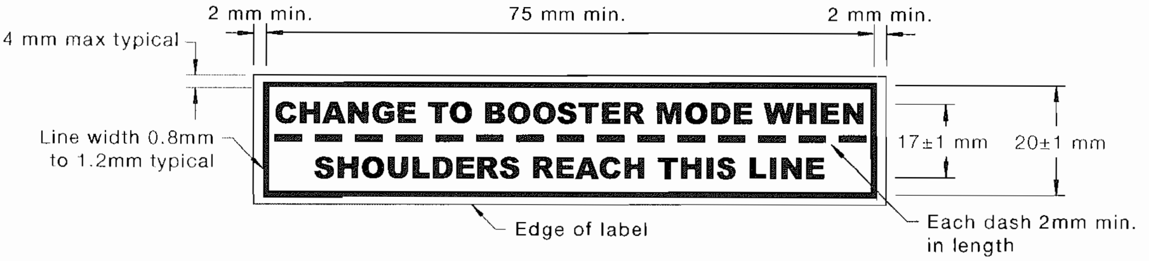
(iii) Label 3, transition height marker for rear facing combination Type A and Type B height marker


2 mm min.
75 mm min.
2 mm min.
4 mm max typical
Line width 0.8mm to 1.2mm typical
SHOULDERS BELOW THIS LINE WHEN
HEADREST AT HIGHEST POSITION
17±1 mm
20±1 mm
Edge of label
Each dash 2mm min. in length

(iv) Label 4, maximum height marker for a seat with moving headrest in the highest position


2 mm min.
75 mm min.
2 mm min.
4 mm max typical
Line width 0.8mm to 1.2mm typical
SHOULDERS ABOVE THIS LINE WHEN
HEADREST AT LOWEST POSITION
17±1 mm
20±1 mm
Edge of label
Each dash 2mm min. in length

(v) Label 5, maximum height marker for a seat with moving headrest in the lowest position


2 mm min.
75 mm min.
2 mm min.
4 mm max typical
Line width 0.8mm to 1.2mm typical
CHANGE TO BOOSTER MODE WHEN
SHOULDERS REACH THIS LINE
17±1 mm
20±1 mm
Edge of label
Each dash 2mm min. in length

(vi) Label 6, height marker to change to booster seat made for a combination Type B and Type E or F

FIGURE 6.3 SHOULDER HEIGHT LABEL—TYPICAL DIMENSIONS

APPENDIX A

CLOTHING FOR TEST DUMMIES

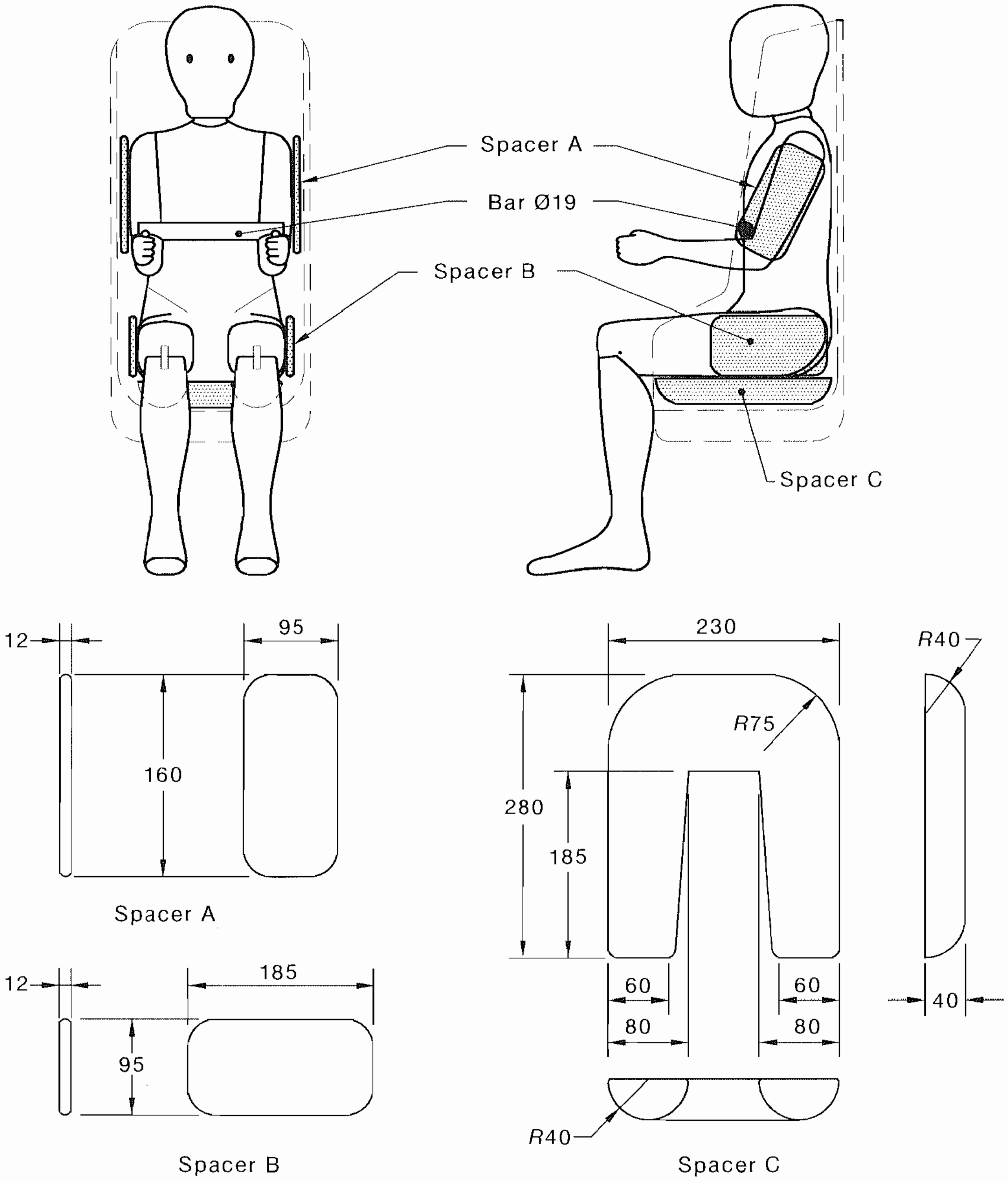
(Normative)

Test dummy	Summer-weight clothing	Winter-weight clothing
TARU Theresa	1 small size disposable nappy	1 small size disposable nappy
	1 summer-weight singlet, Size 0.	1 winter-weight singlet, Size 0.
		1 pair of winter-weight long pants, Size 0.
	1 summer-weight, short-sleeved blouse/shirt, Size 0.	1 winter-weight, long-sleeved fleecy-lined sweatshirt, Size 0.
TNO P¾	1 medium size disposable nappy.	1 cotton 'terry towelling' nappy folded in a conventional triangular configuration without any part of the nappy forming a rolled section.
		1 pair of plastic-lined pilcher pants of appropriate size.
	1 summer-weight singlet of appropriate size.	1 winter-weight singlet of appropriate size.
	1 summer-weight short-sleeved blouse/shirt of appropriate size.	1 winter-weight long-sleeved, fleecy-lined sweatshirt of appropriate size.
	1 pair of summer-weight short or long pants of appropriate size.	1 pair of winter-weight long pants of appropriate size.
TNO P1½	1 medium size disposable nappy.	1 cotton 'terry towelling' nappy folded in a conventional triangular configuration without any part of the nappy forming a rolled section.
		1 pair of plastic-lined pilcher pants of appropriate size.
	1 summer-weight singlet of appropriate size.	1 winter-weight singlet of appropriate size
	1 summer-weight short-sleeved blouse/shirt of appropriate size.	1 winter-weight long-sleeved, fleecy-lined sweatshirt of appropriate size.
	1 pair of summer-weight short or long pants of appropriate size.	1 pair of winter-weight long pants of appropriate size.
	Footwear	Footwear
TNO P3, P6 and P10	1 summer-weight singlet of appropriate size.	1 winter-weight singlet of appropriate size.
	1 summer-weight short-sleeved blouse/shirt of appropriate size.	1 winter-weight long-sleeved, fleecy-lined sweatshirt of appropriate size.
	1 pair of summer-weight short or long pants of appropriate size.	1 pair of winter-weight long pants of appropriate size.

APPENDIX B

SPACERS FOR ATTACHMENT TO TEST DUMMIES

(Normative)



NOTES:

1 Spacers A and B consist of polyurethane material that should be flexible but substantially incompressible.

2 Spacer C consists of polyurethane material with the following characteristics:

Shore hardness: 50 to 55 Shore A

Specific mass: 1.3 kg/L

Tensile strength: 1.5 N/mm^2

3 Spacer C is attached by adhesive tape to the legs of the dummy for the available length of the thighs and by adhesive tape fixed at the ends of the front and back of the torso and passing between the legs of the dummy.

DIMENSIONS IN MILLIMETRES

APPENDIX C

INSTRUCTIONS TO BE SUPPLIED FOR INSTALLATION OF THE UPPER ANCHORAGE FITTINGS

(Normative)

C1 FOR CARS FITTED WITH A CHILD RESTRAINT ANCHORAGE POINT

Locate the anchorage point behind the rear seating position (consult the car owner's handbook for the location of the anchorage point).

Remove the thread plug from the parcel shelf/floor/roof and install the attachment bolt as shown in Figure C1.

CAUTION: DO NOT OVERTIGHTEN THE ATTACHMENT BOLT. MAXIMUM TORQUE 20 Nm.

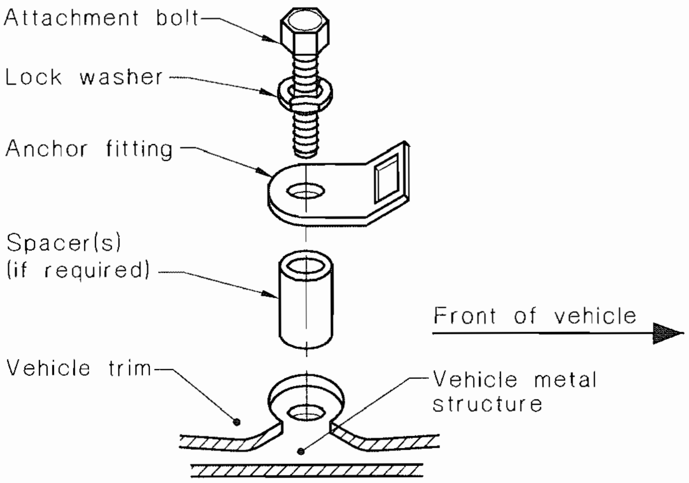


FIGURE C1 UPPER ANCHORAGE FITTINGS

C2 FOR CARS NOT FITTED WITH A CHILD RESTRAINT ANCHORAGE POINT

C2.1 For sedans only

Drill a 9 mm diameter hole in the parcel shelf on the centre-line of the seating position as shown in Figure C2. Install the anchor bolt as shown in Figure C2.

C2.2 For vehicles other than sedans

In Australia, consult your nearest child restraint fitting station or traffic authority for vehicle inspection to find the best, correct position for the placement of the anchorage point, and for the correct attachment bolt length and use of spacers. In New Zealand, consult the agent for the vehicle.

WARNING: CHILD RESTRAINTS MUST NOT BE ATTACHED TO UNSOUND METAL OR TO WOOD, OR SYNTHETIC STRUCTURES. WHEN DRILLING THE 9 mm HOLE DO NOT DRILL THROUGH FUEL LINES, FUEL TANKS, ELECTRICAL WIRING, OR RADIO SPEAKERS. WEBBING STRAPS MUST BE PROTECTED FROM SHARP CORNERS AND EDGES.

THE ANCHOR FITTING MUST BE USED ONLY AS DESCRIBED ABOVE. IT MUST NOT BE HOOKED ONTO ANY OTHER OBJECT.

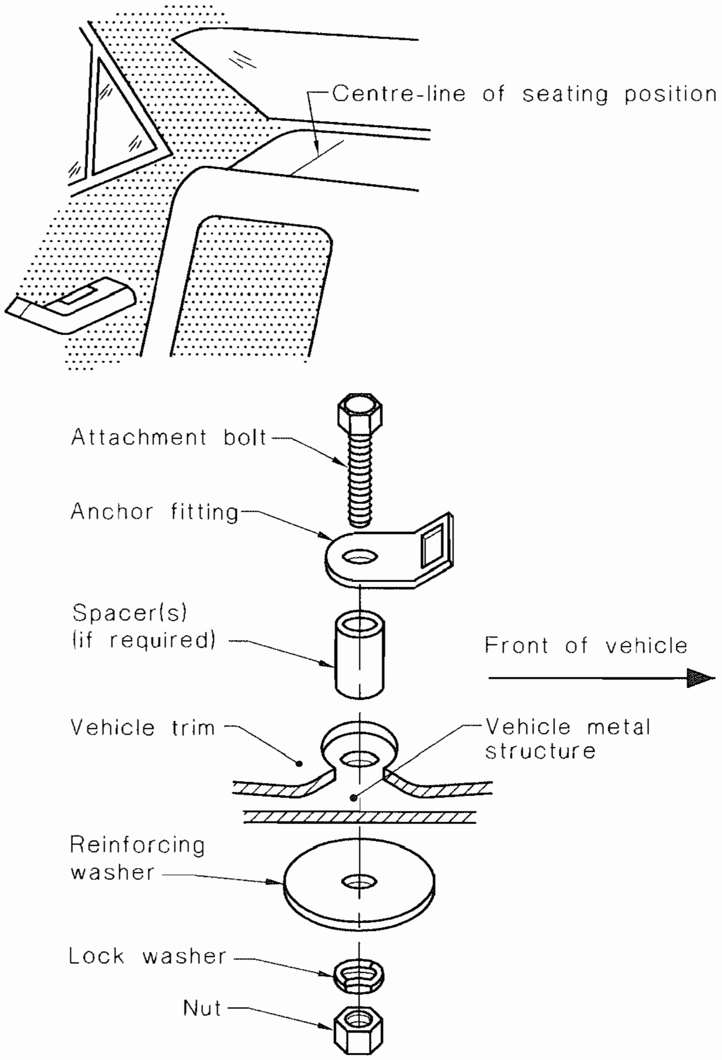


FIGURE C2 UPPER ANCHORAGE FITTINGS FOR SEDANS ONLY

APPENDIX D

RECOMMENDED DUMMY TYPES

(Informative)

The following data, excluding TARU Theresa, is as specified in the FTSS Users Manual, 1 November 2000:

REPRESENTED AGES AND MASSES FOR CHILD DUMMIES

Child dummy	Represented age	Nominal mass (kg)
TARU Theresa	6 weeks	4
TNO P¾	9 months	9
TNO P1½	18 months	11
TNO P3	3 years	15
TNO P6	6 years	22
TNO P10	10 years	32*

* Additional 3 kg is to be added to the TNO P10 to increase the nominal mass to 36 kg where required. 1 kg to be placed in the back pelvic cavity. 1 kg placed in each of the back chest cavities. Foam and tape can be added to ensure there is no movement of the masses.

APPENDIX E

EXPLANATION OF SHOULDER DESIGNATION

(Informative)

E1 GENERAL

Parents and carers are responsible for the selection and use of child restraints when transporting children in motor vehicles. However the size and mass of children vary widely and the selection of a suitable child restraint has not always been straightforward. Until recently, the mass of a child has been the basis for selection of an appropriate child restraint, with child restraints classified according to the range of masses of children who may use the restraint.

Research has identified that the selection of an appropriate size of child restraint based on the mass of a child can be confusing for consumers because the mass of the child may not always be accurately known, and the mass range for a particular child restraint may not be known or understood. Sometimes, this may lead to progression from one restraint type to the next at the earliest possible stage, when it is probably better that progression occurs at the latest possible stage. Furthermore, for a given mass, the height of children varies and this in some instances, may lead to poor harness fit.

The Joint Standards Australia/Standards New Zealand Committee CS-085, Child Restraints for Use in Motor Vehicles, has considered alternative ways for specifying the selection of child restraints.

It is important to understand that the old-style mass limits do not directly determine the design or performance of the seat. Design and performance are determined by the series of requirements and tests, for which specified crash test dummies are used. The mass limits and overlaps between restraint types were originally used to describe the range of the distribution of children's masses at particular ages. So, the previous guidelines would suggest a transition from Type B to Type E for children between 14 kg and 18 kg. This more-or-less describes the mass limits of children on their fourth birthday.

Age can be used to guide selection. However, given the desire to encourage restraint transitions as late as possible, and in line with the child's size, a more direct approach has been built into this edition of the Standard.

Committee CS-085 has revised this Standard on the basis that the fit of a child in a child restraint is largely determined by the dimensions of the child in relation to the restraint system. New requirements for marking minimum and maximum shoulder heights on a child restraint will make selection and use of an appropriate restraint easier for parents and carers.

The technical requirements of AS/NZS 1754 continue to require the use of test dummies of a specified anthropometry and mass. However, the information provided to consumers regarding selection of child restraints will now be based on shoulder height, with visible markings of shoulder height limits on all new child restraints. An approximate age range is also specified to indicate when these shoulder height limits are likely to be reached. The shoulder height marking is intended to be the definitive selection criterion. Child restraints currently on the market are not expected to undergo major redesign in response to this requirement, but will need appropriate marking, and consumers will need to adapt to the new method of restraint selection.

E2 INDICATIVE ANTHROPOMETRIC DATA

The detailed anthropometric body segment data are based on data collected in two US reports—

SNYDER, RG, SCHNEIDER, LW, et al. (1977). *Anthropometry of infants, children, and youths to age 18 for product safety design*. Highway Safety Research Institute, University of Michigan.

SNYDER, RG, SPENCER, ML, et al. (1975). *Physical characteristics of children as related to death and injury for consumer product safety design*. University of Michigan.

In addition, population heights and weights are based on CDC. (2000). 'Clinical Growth Charts.' http://www.cdc.gov/nchs/about/major/nhanes/growthcharts/clinical_charts.htm

NOTE: In some cases, data have been interpolated between age categories in the original data for consistency.

Weight (kg) – CDC (2000) Boys

Age	Percentile		
	5%	50%	95%
6 months	5.9	7.55	9.5
12 months	8.6	10.3	12.4
4th birthday	13	16	20
6th birthday	17	20.5	27
8th birthday	20	25.5	35
10th birthday	24.5	32.5	46

Seated shoulder height (cm) Snyder et al, 1975

Age	Percentile		
	5%	50%	95%
6 months	24.5	29.0	33.4
12 months	26.3	30.7	35.2
4th birthday	31.7	35.3	38.7
6th birthday	35.1	39.1	43.5
8th birthday	39.2	43.1	47.3
10th birthday	42.7	46.6	50.9

Seated eye height (cm) Snyder et al, 1977

Age	Percentile		
	5%	50%	95%
6 months (crown to rump)	39.9	43.8	47.9
12 months (crown to rump length)	43.4	47.6	51.2
4th birthday	41.9	46.6	51.6
6th birthday	46.6	52.2	56.6
8th birthday	52.0	57.1	62.0
10th birthday	55.2	60.6	64.8

Height (cm) CDC (2000)

Age	Percentile		
	5%	50%	95%
6 months	62.0	66.1	70.6
12 months	71.0	75.5	80.6
4th birthday	94.6	101.5	108.7
6th birthday	106.8	115.1	123.6
8th birthday	118.5	127.7	137.6
10th birthday	127.6	138.3	149.5

Buttock to Popliteal length (cm) see Bilston and Sagar, 2007

Age	Percentile		
	5%	50%	95%
6 months	—	—	—
12 months	—	—	—
4th birthday	23.2	24.5	28.5
6th birthday	26.2	29.2	32.1
8th birthday	30.7	33.4	37.2
10th birthday	33.8	37.2	41.6

For further discussion of restraint ergonomics and sizing issues, see Bilston, LE and Sagar, N. Geometry of rear seats and child restraints compared to child anthropometry, *Stapp Car Crash Journal*, 2007.

E3 RELATED INFORMATION

Additional information is available from:

ANDERSON, RWG and HUTCHINSON, TP (2008). 'Optimising product advice based on age when design criteria are based on weight: child restraints in vehicles', *Ergonomics*, 52(3), pp 312-324.

National Transport Commission, *Australian Road Rules 7th Amendment Package—Regulatory Impact Statement*. November 2007.

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Amendment No. 1
to
AS/NZS 1754:2010
Child restraints for use in motor vehicles

CORRECTION

The 2010 edition of AS/NZS 1754 is amended as follows; the amendments should be inserted in the appropriate places.

SUMMARY: This Amendment applies to the Clauses 4.3.8 and 5.2.1.

Published on 9 November 2012.
Approved for publication in New Zealand on behalf of the Standards Council of New Zealand on 29 October 2012.

AMDT
No. 1
NOV
2012

Clause 4.3.8

In Item (f), *add* a new second sentence as follows:

For this test, the dummy shall be clothed in a wetsuit made from a neoprene material of nominal thickness of 4 mm.

AMDT
No. 1
NOV
2012

Clause 5.2.1

In Item (b), *add* the following at the end of the sentence:

…, unless specified otherwise.

ISBN (Print) 978-1-86975-578-2 | ISBN (PDF) 978-1-86975-579-9